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Bibliography on Tropical Cyclone Effects, p. 1270

October 1956 No. 10

# METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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*EDITORIAL OFFICE: Washington, D. C. P.O. ADDRESS: Box 1736, Washington 13, D. C. Telephone: REpublic 7-6278.

ADMINISTRATIVE OFFICE: American Meteorological Society, Office of Executive Secretary, 3 Joy Street, Boston 8, Mass.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY is a monthly publication devoted to:

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# METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 7 OCTOBER, 1956 No. 10

## SPECIAL FEATURE IN THIS ISSUE

An Annotated Bibliography on Tropical Cyclone Effects

by
Geza Thuronyi

Prepared for
U. S. Weather Bureau

*(For complete table of contents see back cover)*

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# LIST OF PERIODICALS

**Note:** This list contains the titles of the periodicals which regularly contain material on meteorology or related fields and it comprises only a small percentage of the periodicals from which pertinent articles are abstracted. The preferred form of title entry is given in bold face type.

## PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

**Académie des Sciences, Paris, Comptes Rendus.**
★**Acta Geophysica Polonica,** [Warsaw].
**Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. and Ser. Geofiz.,** [Moscow].
**American Geophysical Union, Transactions,** National Research Council, Washington.
★**American Meteorological Society, Bulletin,** [Boston].
★**Angewandte Meteorologie,** [Potsdam].
**Annales de Géophysique,** Centre National de la Recherche Scientifique, [Paris].
★**Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A and Ser. B,** [Vienna].
**Australian Journal of Physics,** [Melbourne].
★**Australian Meteorological Magazine,** [Melbourne].
★**Ciel et Terre,** Société Belge d'Astronomie, Météorologie et Physique du Globe, [Brussels].
★**Geofisica e Meteorologia,** Società Italiana di Geofisica, [Genoa].
**Geofisica Pura e Applicata,** Istituto Geofisico Italiano, [Milan].
★**Geophysical Magazine,** Japan Meteorological Agency, [Tokyo].
**Hemel en Dampkring,** [The Hague].
★**Idöjárás,** Magyar Meteorólogiai Társaság and Országos Meteorológiai Intézet, [Budapest].
★**Indian Journal of Meteorology and Geophysics,** [Delhi].
★**Journal of Atmospheric and Terrestrial Physics,** [London].
**Journal of Geophysical Research,** [Washington].
★**Journal of Meteorological Research,** [Tokyo].
★**Journal of Meteorology,** American Meteorological Society, [Boston]
★**Journal Scientifique de la Météorologie,** Société Météorologique de France, [Paris].
★**The Marine Observer,** Air Ministry, Meteorological Office, London.
★**The Meteorological Magazine,** Air Ministry, Meteorological Office, London.
★**Meteorological Society of Japan, Journal,** [Tokyo].
★**La Météorologie,** Société Météorologique de France, [Paris].
★**Meteorologiia i Gidrologiia,** [Leningrad].
★**Meteorologische Rundschau,** [Berlin].
★**Meteoros,** [Buenos Aires].
★**Monthly Weather Review,** U. S. Weather Bureau, Washington, D. C.
**Polarforschung,** Archiv für Polarforschung, [Kiel, Germany].
★**Przegląd Meteorologiczny i Hydrologiczny,** [Warsaw].
**Revista de Geofísica,** Instituto Nacional de Geofisica, [Madrid].
★**Revista Meteorologica,** Junta Nacional de Meteorología, Montevideo.
★**Revista di Meteorologia Aeronautica,** Associazione Culturale Aeronautica, [Rome].
★**Royal Meteorological Society, Quarterly Journal,** [London].
★**South Africa. Weather Bureau, Notos,** [Pretoria].
★**Tellus,** Svenska Geofysiska Föreningen, Stockholm.
**Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia,** [Moscow-Leningrad].
★**Weather,** Royal Meteorological Society, [London].
★**Weatherwise,** American Meteorological Society, [Boston].
★**Wetter und Leben,** Österreichische Gesellschaft für Meteorologie, [Vienna].
★**WMO Bulletin,** World Meteorological Organization, [Geneva].
★**Zeitschrift für Meteorologie,** Meteorologisches Observatorium, Potsdam.

★ Indicates those periodicals which are primarily meteorological.

# FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to ing to the attention of meteorologists current literature in their field and in related fields and provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, c., arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of important references a special subject. No attempt is made to prepare exhaustive bibliographies; instead, the m is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues were:

Vol. I, 1950

| | | | |
|---|---|---|---|
| Atmos. Pollution | 2. Aerobiology | 3. Cloud Physics | 4. Hail |
| Tornadoes | 6. Volcanic Dust | 7. Climat. Changes | 8. Thunderstorms |
| Icing | 10. Acoust. Propagation | 11. Evaporation | |

Vol. II, 1951

| | | | |
|---|---|---|---|
| Extended Forecast. | 2. Long Range Forecast. | 3. Soil Temp. | 4. Constants, etc. |
| Clim. of Near East | 6. Clim. of Middle East | 7. Special Winds | 8. Radar Storm Detect. |
| Condensation Trails | 10. Clim. of N.E. Africa | 11. Mountain Met. | |

Vol. III, 1952

| | | | |
|---|---|---|---|
| Clim. of N.W. Africa | 2. Carbon Dioxide | 3. Clim. of Argentina, etc. | 4. Dew |
| Objective Forecast. | 6. Stratus Forecast. | 7. Urban Climatology | 8. Clim. of C. Africa |
| Visibility | 10. Glaze and Rime | 11. Free Air Turbulence | |

Vol. IV, 1953

| | | | |
|---|---|---|---|
| Turbulence Theory | 2. Turbulent Diffusion | 3. Frost | 4. Clim. of Australia, etc. |
| High Level Winds | 6. Winds in Stratosphere | 7. Jet Stream | 8. Radiation Bioclim. |
| Clim. of Pacific | 10. Auroras | 11. Sferics | |

Vol. V, 1954

| | | | |
|---|---|---|---|
| Oceanog. Met. | 2. Clim. of S.E. Asia | 3. Auroral Physics | 4. Tropopause |
| Balloons | 6. Numerical Forecast. | 7. Radiation Data | 8. Vertical Motion |
| Clim. of Arctic | 10. Industrial Met. | 11. Wind Waves and Swell | |

Vol. VI, 1955

| | | |
|---|---|---|
| 1. Bibliog. of Bibliog. | 2. Texts & Monogr. Bibliogs. | 3. Storm Surges |
| 4. Ionospheric Prop. | 5. Photochem.—Upper Atmos. | 6. Cloud Physics |
| 7. Radar Cloud Physics | 8. Atmos. Nuclei (1841–1950) | 9. Atmos. Nuclei (1951–1955) |
| 0. Weather Modification | 11. Cooling Power | |

Vol. VII, 1956

1. Synoptic Meteorology of the Arctic
2. Climate of Enclosed Spaces
3. Cosmic Rays in the Atmos. (–1952)
4. Cosmic Rays in the Atmos. (1953–1956)
5. Atmospheric Radioactivity
6. Tropospheric Inversions
7. Snow Micrometeorology
8. Snow Micrometeorology (Supplement)
9. Tropical Cyclones, Hurricanes and Typhoons
10. Hurricane and Storm Surge Damage

Forthcoming bibliography will be:

1. Tropical Cyclone Theory, Vol. 7, No. 11, Nov. 1956.

Other bibliographies in preparation are:

*Actinometers*
*Fog Forecasting*
*Forest Micrometeorology*
*Hurricane Theory*
*Microwave Propagation*
*Night Airglow*
*Ozone*
*Singularities*
*Solar-Weather Relations*
*Synoptic Aerology*

Part III contains a listing of reviews, and the contents of those journals which are pri- arily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. The December issue omprises cumulative author, subject, geographical and journal indexes.

# EXPLANATIONS

**Location of material:** For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

**Library symbols** used frequently may be found in the following list:

| | |
|---|---|
| **DA:** | U. S. Dept. of Agriculture Library, Washington, D. C. |
| **DBS:** | U. S. Bureau of Standards Library, Washington, D. C. |
| **DGS:** | U. S. Geological Survey Library, Washington, D. C. |
| **DLC:** | Library of Congress, Washington, D. C. |
| **DN-HO:** | U. S. Navy Hydrographic Office Library, Suitland, Md. |
| **DSG:** | U. S. Army Medical Library, Washington, D. C. |
| **DSI:** | Smithsonian Institution Library, Washington, D. C. |
| **DWB:** | U. S. Weather Bureau Library, Washington, D. C. |
| **GB-MO:** | Great Britain, Meteorological Office Library, Harrow, England. |
| **MH-BH:** | Harvard University, Blue Hill Observatory Library, Milton, Mass. |

**Other symbols:**

| | |
|---|---|
| * | before an entry indicates a good data source. |
| † | before an entry indicates a good bibliography. |
| § | before an entry indicates a synoptic case history study accompanied by charts. |

**Geographic locations** are in the English form rather than the form used locally, for example Moscow for Moskva.

**Titles of articles or monographs** are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

**Abbreviations:**

*Titles of periodicals* are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

*Meteorologische Rundschau*, 2(5/6):146–151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5/6 (No. 5/6), *pages* 146–151, May/June 1950.

# PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

## MAJOR GENERAL WORKS

### COLLECTED WORKS

*See also:* **Polarization of skylight** (Calif. Univ. at L. A.), 7.10–288.

7.10–1 551.521.64:551.594.6:523.75

Cranshaw, T. E.; Galbraith, W. and Porter, N. A., **Cosmic-ray observations during the flare of 23 February 1956.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(4/5): 274–276, May 1956. 3 figs. Also: Lambie, M. and Elliot, H., **Cosmic rays and the solar flare of 23 February 1956.** *Ibid.*, p. 277–278. table, ref. Also: Marsden, P. L.; Berry, J. W.; Fieldhouse P. and Wilson, J. G., **Variation of cosmic-ray nucleon intensity during the disturbance of 23 February 1956.** *Ibid.*, p. 278–281. fig., 2 tables, 3 refs. Also: Belrose, J. S.; Devenport, M. H. and Weekes, K., **Some unusual radio observations made on 23 February 1956.** *Ibid.*, p. 281–286. 5 figs., 4 refs. Also: Gold, T. and Palmer, D. R., **The solar outburst, 23 February 1956: observations by the Royal Greenwich Observatory.** *Ibid.*, p. 287–291. 4 figs., table, 2 refs. Also: Ellison, M. A. and Reid, J. H., **A long-wave anomaly associated with the arrival of cosmic-ray particles of solar origin on 23 February 1956.** *Ibid.*, p. 291–293. 2 figs. **DWB**—Records at Harwell showed a sudden rise of coincidence rate to 3 times normal at 0345±2 min on Feb. 23. In London the increase was 120% in 0345–0400 and at Leeds the nucleon intensity rose to 47 times normal in the same period. At Cambridge the sky wave on 16 and 71 Kc/s behaved abnormally and there was a sudden drop in average intensity of atmospherics at 0345; these are attributed to a sudden change in the height of reflection and amplitude. Conditions were still markedly abnormal at sunrise but recovered during the night. Cosmic ray counts and atmospherics at Hurstmonceux showed similar fluctuations. At Abinger a magnetic storm began suddenly on Feb. 25. A photograph of the flare at Kodaikanal is included. At Edinburgh long wave atmospherics decreased suddenly but galactic noise was steady. *Subject Headings:* **1. Cosmic ray variations 2. Sferics 3. Solar flares.**—*C.E.P.B.*

7.10–2 551.5(09)

*Spasskiĭ, Mikhail Fedorovich, **Izbrannye raboty po fizike atmosfery.** [Selected works on the physics of the atmosphere.] Moscow, Izdat. Tekhniko-teoreticheskoĭ literatury, **1951.** 342 p. figs., 49 tables, foot-refs., eqs. **DLC**—This collection of historical Russian meteorology contains an introductory article by A. Kh. Khrgian on geophysical research of Russian scientists of the 18th and 19th centuries, p. 9–49, one by A. F. Kononkov on the life and works of P. I. Strakhov, 1757–1813, p. 50–69; another by Khrgian on the life and works of M. F. Spasskii, 1809–1859, p. 70–90, and in the body of the text, selected works on physics of the atmosphere: Strakhov, P. I., **O svoĭstvakh vozdukha** [On properties of air], p. 94–107; Spasskii, M. F., **O klimate Moskvy** [On the climate of Moscow], p. 108–283; and Spasskii, M. F., **Rech' ob uspekhakh meteorologii** [Progress in meteorology], p. 284–332. Appended are notes of the editor, giving biographical and other information about authors and works mentioned in the text (p. 333–342). The work on the climate of Moscow, published in 1847 by the Moscow Univ. Press, is one of the most analytical treatments of temperature of a locality (based on records from 1820–1846) ever published. Monthly, seasonal, annual, 5-year and decadal means are compared with normals of two periods, 1820–33 and 1834–46 and for the entire 26 years. Records for 1780–1792 obtained during collaboration with the Meteorological Society of the Palatinate, are also compared with 1820–1846 records. In Pt. 2, precipitation, snow, barometric pressure, wind (data for temperature and pressure wind roses are also given) and other factors are analyzed and in Pt. 3 the "causes" of the climate of Moscow

are analyzed and comparison is made with other European and Siberian stations with long records. *Subject Headings:* **1. History of meteorology 2. Climate of Moscow 3. Biography of M. F. Spasskiĭ 4. Biography of P. I. Stakhov 5. Moscow.**—*M.R.*

## BOOKS

7.10–3 551.5:6(02)

Cook, James Gordon, **Our astonishing atmosphere.** London, George G. Harrap, **1955.** 200 p. photos. **DLC**—A popular book on meteorology discussing, in addition to the basic facts about the atmosphere, such recent applications as wind power utilization, trans-sonic and stratospheric flight; ultrasonic waves and shock waves, modern synoptic analysis and forecasting methods; oxygen and its effects on life; use of nitrogen in fertilizers and synthetic materials (foods, drugs, etc.); sources of and use of $CO_2$ (in plant growth, etc.); moisture in the air and its importance successful and unsuccessful artificial cloud, fog or rain modification attempts; use of rockets in exploring the atmosphere; use of $O_3$, He, Ne, Kr, Xe; organic matter in the atmosphere, poisons and other pollutants; thunderstorms, auroras and, finally, cosmic rays. *Subject Headings:* **1. Applied meteorology 2. Popular meteorology books.**—*M.R.*

7.10–4 551.579(02)

†Kuenen, Philip Henry (*Univ. of Groningen, Netherlands*), **Realms of water: some aspects of its cycle in nature.** Revised version trans. by May Hollander. New York, John Wiley, **1955.** 327 p. 190 figs., 16 plates, 58 refs. **DWB.** Translation from original Dutch, **De Kringloop Van Het Water.** The Hague, N.V. Leopold Uitg., **1948.** 408 p. 210 figs. (incl. photos), bibliog. p. 395–397. **DLC.** See p. 1310 for reviews in *Science Progress* and in *Geographical Journal*—The subject of water in all of its manifestations in nature, is treated in this popular but scientific book which has been available only in the Dutch edition until now. The hydrologic cycle, water in oceans (waves, breakers, tides, currents, evaporation, condensation, clouds, rain, etc.); water in the solid state (snow on ground, avalanches, glaciers, the glacial periods); ground water (springs, karst, caves, water supply from artesian and ground water sources), surface waters (lakes, waterfalls, rivers, deltas, watersheds, erosion) and, finally, the water balance (total amount on earth, salinity of oceans and distribution in cycle). Many fine photographs and hundreds of line drawings are included. The treatment is worldwide with respect to illustrations and interest. *Subject Headings:* **1. Hydrology textbooks 2. Hydrologic cycle. I. Hollander, May** (*trans.*).—*M.R.*

7.10–5 551.579(02)

*Luchsheva, A. A., **Prakticheskaia gidrometriia.** [Practical hydrometry.] 2d ed. Leningrad, Gidrometizdat., **1954.** 335 p. diagrs. (some fold.), tables, refs. p. 328. **DLC**—Useful handbook for students of hydrometric courses in hydrometeorological technical schools and field hydrological technicians giving a great deal of explanation and many exercises for the processing and working out of river gage data, the calibration of instruments and apparatus, making depth measurement records, taking of river current logs, the calculation of water discharge and of suspended and transported silt, construction of discharge curves and runoff calculation. The book also provides ample information and description of laboratory tests on the separation and weighing of sediment in water samples, the determination of its specific gravity and volume, and on the basic analyses of the composition of silt and bottom deposits in rivers. Numerous tables and graphs illustrate the text. *Subject Headings:* **1. Hydrometry textbooks 2. Hydrology 3. River hydrology.**—*A.M.P.*

7.10–6 551.586:581.5

†Lundegårdh, Henrik Gunnar, **Klima und Boden in ihrer Wirkung auf das Pflanzenleben.** [Climate and soil in their influence on plant life.] 4th rev. ed. Jena, VEB Gustav Fischer Verlag, **1954.** 598 p. map (fold.), 127 figs. (incl. photos), 46 tables, numerous foot-refs. **DLC**—This systematic treatise on physiological plant ecology contains a comprehensive discussion of the role of the individual meteorological variables such as light, temperature and moisture in the growth and geographical distribution of plants with particular emphasis upon the interaction of climate, soil and plants. The author discusses the radiation climate of the earth, effect of visible radiation upon growth, movement, pigment formation and germination

f plants, the effect of light upon $CO_2$ assimilation, the light climate of plant stands (alpine, esert, etc); the effect of temperature upon physiological processes of plants, the temperature mits of life, effect of temperature upon assimilation, in particular soil temperature, temerature as a factor in plant geography, water storage of soil, water and transpiration, adaptaion of plants to water, importance of water as a factor in plant geography, etc. *Subject Headings:* **1. Physiological plant ecology 2. Climatic effects on plant life.**—*I.L.D.*

## MONOGRAPHS

*See also:* **Mathematical expression of annual temp. variations** (Mavridis), 7.10–180.

7.10–7 551.506.2(410):551.574.42

§Brooks, C. E. P. and Douglas, C. K. M., **Glazed frost of January 1940.** *Great Britain. Meteorological Office, Geophysical Memoirs*, No. 98, **1956.** 38 p. 5 figs., charts, 11 plates, 5 tables, 12 refs. At head of t.-p. M.O. 584f. **DWB**—This memoir describes an occurrence probably unique in Britain. Pt. I summarizes the phenomena with daily maps from Jan. 27–Feb. 3 and numerous photos, and relates them to the surface temperature distribution. Pt. 2 describes the synoptic developments, with a series of synoptic charts. These show two belts of precipitation on fronts at the eastern edge of a south to south-west flow held up over south-west Britain by a cold south-east current with a large cross-isobaric component. The period Jan. 26–30 is analyzed in detail including upper winds which show the important part played by ageostrophic motion. *Subject Headings:* **1. Glaze storms 2. Synoptic studies 3. Great Britain.**—*C.E.P.B.*

7.10–8 551.524.3

†Cushman, Charles S., **Interdiurnal temperature changes in Alaska.** University of Washington, Thesis, **1953.** 115 p. 23 figs. (incl. maps), 38 tables, 40 refs. Photostat. **DAWS**—Thorough analysis based on 10 years of U. S. Weather Bureau data (1943–52). The author considers the interdiurnal variability of daily mean and extreme temperatures to be more significant than the interdiurnal variability computed from temperatures at a fixed hour, and accordingly he presents monthly mean values of the former parameters for each of several Alaskan stations. The spatial variation of these parameters is shown in isoline maps of Alaska for Jan., Feb., April, July, Aug. and Oct. In an extended discussion of seasonal and regional variations, reference is made to causal factors—frontal passages, marine influence, ice cover, etc., but the data themselves are not related statistically to specific synoptic features. A general survey of the literature on interdiurnal temperature variations is given, along with pertinent references. *Subject Headings:* **1. Interdiurnal temperature variations 2. Temperature variability 3. Alaska.**—*R. S. Quiroz.*

7.10–9 551.515.3

†Delver, A., **Hozen en hozentheorieën.** [Tornadoes and tornado theories.] *Netherlands. Meteorologisch Instituut, Verspreide Opstellen*, No. 2, **1954.** 83 p. 40 figs., 85 refs. **DWB**—This moderately technical monograph contains a description of windspouts, tornadoes, dust devils, fire tornadoes and experimental tornadoes, the meteorological and physical characteristics of tornadoes and allied phenomena based upon some 300 cases and theories of tornado formation. With the aid of numerous photographs and diagrams and also simple equations, the author discusses relationships of tornadoes to cirronimbus, precipitation area, the field of movement, the horizontal pressure field, the various theories explaining the origin of tornadoes such as those of ROSSMANN and SHOWALTER, the mechanical theories of WEGENER and TEPPER and the thermodynamic theories of FULKS, KOSCHMIEDER and BLEEKER and DELVER. *Subject Headings:* **1. Tornado theory 2. Tornado formation.**—*I.L.D.*

7.10–10 551.506:551.574.41(431)

†*Gelbke, Wolfgang, **Untersuchungen zur Methodik der Taumessung an Hand dreijähriger Taumessreihen in Greifswald.** [Research in methods of dew measurement by means of a three-year dew measurement series at Greifswald.] *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Abhandlungen*, 5(38), **1955.** 104 p.

15 figs. (incl. photos), 11 plates, 13 tables, tables in appendix, 64 refs. **DLC**—A thorough monographic treatment of the problems of dew measurement and an analysis of the results of dew measurements made at Greifswald from June 1951 to Nov. 1953. The various methods (19) of measurement used in the past (1892–1953) are tabulated, showing general nature and characteristics of device. Theories of dew formation, effects of season, time of day, weather situation, wind, cloud and saturation deficit are discussed and illustrated. The E. Leick dew recorder (plate) and its records, characteristics, difference between temperature of black and white plate, between upper and lower surface, between records on clear and cloudy nights, between windward and lee sides; effect of wetness of plate, etc. are analyzed. Comparisons between the Leick and the Kessler-Feuss apparatus are made in regard to several characteristics. The actual records for the 3 years 1951–53 (April–Nov.) are analyzed in relation to month, weather and geographical location. A full bibliography (mostly of German literature), and extensive tables showing for each day of each month the Kessler and Leick records, the wind, cloudiness and weather type, and several recorder records and schematic diagrams showing installation, frequency graphs showing relationships of numerous types, etc. are appended. *Subject Headings:* **1. Dew measurement research 2. Dew data 3. Greifswald, Germany.**—*M.R.*

7.10–11 551.506.5(269)

*Lamb, H. H., **Meteorological results of the Balaena expedition 1946–47.** *Great Britain. Meteorological Office, Geophysical Memoirs*, No. 94, **1956.** 68 p. 10 figs., 5 plates, numerous tables, 44 refs. At head of t.-p. M.O. 584b. **DWB**—The floating whaler-factory "Balaena" sailed from Belfast Sept. 27, 1946, carrying 2 aircraft, and reached sub-Antarctic waters in Nov. She then sailed from 40° to 113°E and back, mainly in 60–65°S, until April 13, 1947. The bulk of this report consists of detailed synoptic observations 4 times daily; in addition 90 pibal ascents and some special airplane flights were made. Instruments and difficulties are described. The meteorology of the Antarctic is discussed in some detail, including a revision of the mean annual pressure pattern. Pt. 3 discusses weather analysis and forecasting in the Southern Ocean based on a series of synoptic charts for 156 days (not reproduced). *Subject Headings:* **1. Antarctic expeditions 2. Whaling expeditions 3. "Balaena" Expedition, 1946–1947 4. Antarctica.**—*C.E.P.B.*

7.10–12 551.551

†Miller, James E.; Blackadar, Alfred K.; Chiu, Wan-cheng and Dryden, Warren A., **Experimental studies of small scale turbulence.** N. Y. Univ. College of Engineering. Research Div., Contract AF 19(122)-261, Final Report, Aug. **1955.** 139 p. 66 figs. (incl. photos), bibliog. p. 137–139.—This is the final report of a project to study small scale turbulence in air by means of a specially devised photographic technique. The basic theory, derived from REYNOLDS' theory, defines the turbulent quantities as natural results of averaging the equations of motion. Many of these quantities are computed in a number of controlled experiments from an analysis of air motions observed by photographing the trajectories of small airborne particles. The spectrum of eddy energy and its rate of dissipation are determined for one of the experiments. A function representing the rate of transformation of mean energy into eddy energy is computed and discussed. Eddy thermodynamics and the flux of eddy energy are investigated theoretically and by means of data from experiments of this project and other experiments. A number of miscellaneous investigations are described. *Subject Headings:* **1. Turbulence measurement 2. Turbulence theory 3. Eddy flux.**—*Authors' abstract.*

## MANUALS

*See also:* **Manuals for visual observation of Aurora Australis** (Thomsen), 7.10–299.

7.10–13 551.5:629.13(024)

§Great Britain. Royal Air Force, **Elementary meteorology for aircrew.** Its *Manual*, [unnumbered], Dec. **1954.** 174 p. 125 figs., tables. **GB-MO**—This handbook opens with a description of the value of meteorology, the organization of the Meteorological Office and facilities available to the Royal Air Force. Then follow simple and well illustrated chapters on the atmosphere, wind, temperature and humidity, vertical motion, cloud and precipitation, visibility, air masses and their weather, pressure systems and their weather, fronts, fog, icing,

and thunderstorms, electrical effects and turbulence. Upper air conditions are of course well covered. Several of the illustrations are in two colors. *Subject Headings:* **1. Aeronautical meteorology 2. Manuals.**—*C.E.P.B.*

7.10–14 551.5:629.13:06

U. S. Office of Aviation Development (*Civil Aeronautics Administration*), **Flight information manual,** Vol. 8, May 25, **1954.** 103 p. tables, forms, diagrs. "This issue supersedes the May 1, 1953 Flight Information Manual and includes all pertinent data previously published in the Airman's Guide through vol. 9, no. 5, May 18, 1954." **DWB**—Besides all manner of airways, airport and flying information and codes, lists of radio aid stations, etc. in the U. S., the Weather Bureau-CAA information service is described and the stations in the U. S. which have such service listed by states. Every 6 hours the U. S. W. B. prepares aviation forecasts for 12-hr periods for 375 air terminals in the U. S., Alaska and Hawaii. Twenty-four hour terminal forecasts are prepared for 120 major airports in the U. S. and 12-hr forecasts for 30 areas. Pre-flight and in-flight service is also provided. *Subject Heading:* **1. Aeronautical meteorological services.**—*M.R.*

7.10–15 551.542:629.13

§U. S. Office of Research and Inventions, **A report on the theory and application of single heading flight. Additional conclusions and possibilities of pressure navigation.** Wash., D. C., pub. by Office, March **1946.** 49 p. 4 figs. charts, forms, table. bibliog. p. 48–49. **DWB**—Procedures are outlined and examples given of single heading flight in eastern U. S. or Canada at 700 or 850 mb levels. Nomograms and tables are given for calculating single heading flight, which is defined as flight wherein the net drift is calculated in advance and allowed for in the original heading. The calculations using this method are said to be the simplest of any type of pressure flying. *Subject Headings:* **1. Single heading flight 2. Pressure pattern flying 3. Nomograms.**—*M.R.*

7.10–16 551.509.31(02)

Pogosian, Kh. P. (*ed.*), **Uchebnyĭ sinopticheskiĭ atlas.** [Student's synoptic atlas.] Leningrad, Gidrometeoizdat, **1950.** 1 p. of text. 79 maps (fold. in color). **DAWS.** Also his: **. . . Dopolnenie.** [. . . Supplement]. pub. **1951.** 1 p. of text, 49 maps (fold. in color). **DAWS**—The atlas consists of unanalyzed synoptic surface, 900, 700, 500 mb and 500/1000 mb relative topography charts for Europe, and Eurasia (on back of European chart), for Nov. 10, 1948, April 20, 1949, Aug. 20, 1949, Aug. 21, 1949, Feb. 3 and 4, 1948, and Feb. 7, 1948. Some 6 hourly surface charts are also included. The supplement contains analyzed surface 900, 700, 500 and 500/1000 mb charts for each day (18 h and 21 h) from March 20 to 22, 1949 and for Dec. 5 and April 11, 1949. A tremendous amount of surface and upper air data are entered on these charts, which represent various important weather types or sequences. The charts are for study and analysis by students in university and in in-service training courses in synoptic analysis. *Subject Headings:* **1. Synoptic analysis 2. Synoptic surface charts 3. Upper air charts 4. U.S.S.R.**—*M.R.*

## GENERAL GEOPHYSICS AND METEOROLOGY

### GENERAL GEOPHYSICS

7.10–17 621.396.8:523.45 551.577.3:551.590.25 551.583.2:523.6

Ovenden, Michael W., **Radio emission from Jupiter, Pt. 2.** *Science Progress,* London, 44(174):249-251, April **1956.** Also his: **Meteors and meteorology.** *Ibid.,* p. 251–254. And his: **Climate and the discovery of comets.** *Ibid.,* p. 254-255. **DWB**—1. Account of cosmic noise on 18.3 Mc/s at Sydney, Australia, believed to originate in the S. Tropical Disturbance in Jupiter's atmosphere. 2. Discussion of BOWEN's theory that peak rainfall dates (Jan. 12–16, 21–24, 28–Feb. 1) follow meteor showers by about 30 days. 3. Variations in the rate of discovery of comets since 600 B.C. are attributed to long-term variations of climate: the results agree closely with climatic changes inferred from other evidence. *Subject Headings:*

**1. Radio noise 2. Jupiter 3. Rainfall variations 4. Meteor influences 5. Historical climates 6. Comets.**—*C.E.P.B.*

7.10–18 550.384

Chatterjee, J. S., **The crust as the possible seat of earth's magnetism.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(4/5):233–239, May **1956.** fig., 14 refs., 3 eqs **DWB**—The crust of the earth is discussed as a possible seat of the magnetization of the earth. It is shown that the temperature and pressure to which the crust (a thickness of about 20 km) of the earth is subjected, will make its magnetic mineral contents (e.g., Magnetite) highly permeable. The shell can thus be magnetically saturated by a field of very low intensity of the order of 0.01 gauss. It is suggested that the magnetizing field is provided by the "ring current" formed in the space round the earth, during worldwide magnetic storms, as a result of the encounter of the solar neutral corpuscular beams (consisting of an equal number of positive and negative charges) with the earth-magnet. It is shown that an initially existing field of even one-hundredth of the present field is enough to build up the magnetization of the crust to saturation. An explanation of the secular variation is also suggested as caused by the ring current trying to follow (with a lag) the wobbling motion of the magnetic axis round the geographical axis due to the diurnal rotation of the earth. *Subject Heading:* **1. Geomagnetic theories.**—*Author's abstract.*

## IGY, WMO, UN

*See also:* **History of Polar Year** (Regele), 7.10–33; **Bibliog. relating to IGY,** 7.10–37.

7.10–19 551.5:061.6

Perovic, Milisav, **Technical Assistance Programme in Meteorology in Yugoslavia: a review and appraisal.** *World Meteorological Organization, WMO Bulletin*, 4(3):121–122, July **1955.** port. **DWB**—The Yugoslav Hydro-Meteorological Service was reorganized in 1947, and has been able to solve some of its problems by means of the Technical Assistance Program of the U.N. Five top members of the staff, including the director, were able to study for several months in France, Germany, Switzerland and the U.K. Radiosonde, agrometeorology, synoptic meteorology and bioclimatology work was stressed. Experts from U. S. (Beall, 1952), Sweden (Bergeron, 1953), Argentina (Burgos, 1953), U. S. (Max Kohler) assisted. *Subject Headings:* **1. U.N. Technical Assistance Program 2. Yugoslavia.**—*M.R.*

7.10–20 551.5:061.3

**World Meteorological Organization, Second Session of Regional Association VI (Europe).** *Meteorological Magazine*, London, 85(1008):179–182, June **1956.** ref. **DWB**—Account of the Session at Dubrovnik March 12–24, 1956, attended by 71 delegates. Resolutions dealt with standard hours for upper air observations (0, 6, 12, 18 h GMT) and ascents, 150 and 100 mb standard levels, regional climatic atlases, correction of radiosonde observations for radiation, measurement of radioactivity of precipitation and of the atmosphere, exchange of temperature forecasts, extension of teleprinter and radio-teleprinter circuits, and exchange of weather maps by facsimile. *Subject Heading:* **1. WMO. Regional Association VI.**—*C.E.P.B.*

7.10–21 550.3:061.3:551.311.12(47) 061.3:551.**577.46**(47)

Avsiuk, G. A., **Mezhdunarodnyĭ geofizicheskiĭ god 1957/58 i gliatsiologicheskie issledovaniia SSSR v etot period.** [International Geophysical Year 1957/58 and glaciological investigations of U.S.S.R. in this period.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geog.*, No. 6:96–99, Nov./Dec. **1955. DLC**—The general program of the International Geophysical Year 1957/58 as developed in the Brussels and Rome meetings and the special program for the U.S.S.R. by the Academy of Sciences of the U.S.S.R. by 1955 are summarized. The special glaciological and geoclimatological activities to be carried on by the U.S.S.R. are; study of 1) changes in the sizes of glaciers and their development with climatic change: 2) regime and processes of accumulation and diminution of snow in relation to the heat balance of the surface; 3) temperature regime of glacial mass and of the upper layer of the lithosphere;

4) snow cover; 5) flow of melt waters; 6) morphology of glaciers and the structure of glacial ice and firn; 7) the movement of glaciers and the thickness of ice in glaciers; 8) subterranean ice and cryolithology of friable deposits and 10) geocryological processes and cryogenic relief forms. *Subject Headings:* **1. International Geophysical Year program 2. Glaciology 3. Snow accumulation 4. U.S.S.R.**—*I.L.D.*

7.10–22 550.3:061.3(99)

**International Geophysical Year, 1957–58: Antarctica 1955–56.** *Polar Record*, 8(53):182–87, May **1956.** fold. map. **DLC**—The plans of Argentina, Australia, Chile, France, Japan, New Zealand, Norway, South Africa, United Kingdom, United States and U.S.S.R. to establish new stations or extend existing ones in Antarctic and sub-Antarctic regions are described. The stations are listed. Some expeditions have already set out. *Subject Headings:* **1. International Geophysical Year program 2. Antarctic expeditions.**—*C.E.P.B.*

7.10–23 551.5:550.3:061.1(99)

**Antarktis—der Auftakt zum Geophysikalischen Jahr.** [Antarctica: prologue to the Geophysical Year.] *Naturwissenschaftliche Rundschau*, 9(6):235–236, June **1956.** 3 figs. **DWB**—A map is given of the hitherto proposed stations in Antarctica, the countries undertaking them, and some of the preparations already in hand. *Subject Headings:* **1. International Geophysical Year, 1957–1958 2. Antarctic expeditions.**—*C.E.P.B.*

7.10–24 550.3:061.3(99) 551.506.5

Humphrey, Paul (*U. S. W. B., Wash., D. C.*), **The voyage of the Atka.** *Scientific American*, N. Y., 193(3):50–55, Sept. **1955.** photos, figs. **DWB, DLC**—The voyage of the "Atka" in the Antarctic during 1954–55 was a reconnaissance of the most important areas to be explored during the International Geophysical Year. This article contains an account of the exploration of the Bay of Whales and of Little America and an account of the meteorological and oceanographic, geomagnetic and cosmic ray observations made in the Antarctic during the voyage. Maps showing the voyage and the penetration of the "Atka," the various bases designated for the International Geophysical Year and the Little America area in 1947 and 1954 are included. *Subject Headings:* **1. Antarctic expeditions 2. International Geophysical Year program 3. Antarctica.**—*I.L.D.*

## EXPEDITIONS—ARCTIC AND ANTARCTIC RESEARCH

*See also:* **Balaena expedition** (Lamb), 7.10–11; **IGY, glaciological investigations of U.S.S.R.** (Avsiuk), 7.10–21; **Antarctica, 1955–56,** 7.10–22; **Antarctica,** 7.10–23; **Voyage of the Atka** (Humphrey), 7.10–24.

7.10–25 91.04(99)

**Argentine Antarctic Expeditions, 1951–54.** *Polar Record*, Cambridge, 8(53):160–168, May **1956.** Also: **Chilean Antarctic Expeditions, 1952–55.** *Ibid.*, p. 169–172. **DLC**—Argentine expeditions since 1903 are listed. The campaigns of 1951–2, 1952–3, and 1953–4 are described in detail. The Chilean Antarctic expeditions of 1952, 1952–3, 1953–4 and 1954–5 are briefly summarized. The scientific work by both countries was mainly or entirely meteorological and hydrographic, but no details are given. *Subject Headings:* **1. Antarctic expeditions 2. Argentina 3. Chile.**—*C.E.P.B.*

7.10–26 551.521.64:523.75

Fenton, A. G.; McCracken, K. G.; Parsons, N. R. and Trost, P. A., **Cosmic-ray increase observed at high southern latitudes on February 23, 1956.** *Nature*, London, 177(4521):1173–1174, June 23, **1956.** table, 3 refs. **DWB**—Measurements of the large sudden increase in cosmic ray intensity at 0341 G.m.t. at Hobart (Tasmania), Macquarie Island and Mawson, Antarctica (73°S) are described and discussed. A few days before and after the increase the intensity was 2% below normal and this may be due to the screening effect of magnetized gas clouds. *Subject Headings:* **1. Cosmic ray variations 2. Solar flares.**—*C.E.P.B.*

7.10–27 91.04(99)

Kosack, Hans-Peter, **Bericht über die australische Expedition nach MacRobertsonland** [Report on the Australian expedition to MacRobertson Land.] *Polarforschung*, Ser. 3 24(1/2):309–314, 1954, pub. **1956. DWB**—This account of the expedition of 1954–55, put together from reports by R. G. Dovers in the **Antarctic News Bulletin,** details personnel, fitting out, voyages of the "Kista Dan," sledge journeys and activities at Mawson. No meteorology. *Subject Headings:* **1. Antarctic expeditions 2. Australian Antarctic Expedition, 1954–55 3. Mawson, MacRobertson Land, Antarctica. I. Dovers, R. G.**—*C.E.P.B.*

7.10–28 551.577.2(99) 551.579:551.311.17(99)

Kosack, Hans-Peter, **Zur Frage des Wasserhaushalts in der Antarktis. Zum Gedenken an W. Meinardus.** [On the problem of water balance in the Antarctic. In memory of W. Meinardus.] *Polarforschung*, Ser. 3, 24(1/2):286–294, 1954, pub. **1956.** fig., 21 refs. **DWB**—Many of the earlier measurements of precipitation are false because of difficulties of measurement. By melting the snow and ice accumulated during a known period estimates are made from South Georgia to the Pole (20–50 mm) and a chart is constructed showing the annual precipitation, 0° isotherm in Jan. and July, and ice-free regions or thaw-water lakes. The mean precipitation for the Antarctic is put at 201 mm water, or 2846.25 km³ for the whole continent. Losses are: ablation 2045.66, snow drift out to sea 1202.85, icebergs 550, total 3798.51. At this rate the Antarctic ice would disappear in 18,000 yrs. The Quaternary volume of ice was $22.14\times10^6$ km³ compared with $17.16\times10^6$ at present. *Subject Headings:* **1. Precipitation amount 2. Hydrologic balance 3. Inland ice 4. Antarctica.**—*C.E.P.B.*

7.10–29 551.513:551.515(99)

Lamb, H. H., **Antarctic atmospheric circulation.** *Nature*, London, 177(4519):1076–1077, June 9, **1956.** 10 refs. **DWB**—Summary of analyses of daily weather charts. The main concentration of anticyclones is in about 85–82°S, 40–50°E, in the center of the ice-covered region. Deep depressions sometimes pass inland especially in winter, giving west winds on the coast and southerly gales on the plateau south of the Ross Sea. The synoptic situation is very variable. The best weather on the route to the pole is probably between 20°W and 45°E. *Subject Headings:* **1. Atmospheric circulation 2. Antarctica.**—*C.E.P.B.*

## SOCIETIES, INSTITUTIONS, SERVICES

*See also:* **Bioclimatic research at Beirut University** (Słomka), 7.10–276.

7.10–30 551.5:061.2(45)

Ferraro, V. C. A., **Italian Society for Geophysics and Meteorology: Fourth General Assembly.** *Nature*, London, 178(4523):24–25, July 7, **1956. DWB**—Account of meeting at Genoa, April 5–8, 1956. Meteorological papers briefly summarized deal with: the advection vector of perturbations, radioactivity of Alpine air masses, reliability of rainfall normals, evaporation and transpiration of plants, moving ionization of F layer, chemical action of electromagnetic fields and atmospherics, the International Geophysical Year, frequency of cyclones and cloud in the Mediterranean, electric potential of layers close to the ground, and salinity of the atmosphere. *Subject Headings:* **1. Meteorological societies 2. Italian Society for Geophysics and Meteorology.**—*C.E.P.B.*

7.10–31 551.5:061.1(09)(679)

**Serviço Meteorológico de Moçambique.** *American Meteorological Society, Bulletin*, 36(9):483–485, Nov. **1955.** 3 photos. **DWB, DLC**—The Weather Bureau of Mozambique is located at the Campos Rodrigues Observatory at Lourenço Marques. It records and studies meteorological, astronomical and geophysical phenomena in Portuguese East Africa. The organization of the Weather Bureau is described and the subsidiary stations are listed. A photograph of the Campos Rodrigues Observatory is presented. Note by José Alberto Soares, *Ibid.*, 37(7):354, Sept. 1956) corrects several errors in the original article and tells of recent expansion. *Subject Headings:* **1. Meteorological services 2. History of meteorological services 3. Mozambique Weather Bureau 4. Mozambique, Portuguese East Africa. I. Soares, José Alberto.**—*I.L.D.*

# EDUCATION, HISTORY AND BIOGRAPHY

## EDUCATION

7.10–32 551.5:378

†Voigts, Heinrich. **Die Meteorologie in den höheren Schulen.** [Meteorology in higher education.] *Meteorologische Rundschau*, Berlin, 9(5/6):104–108, May/June **1956.** table, 5 refs. **DLC**—A new plan for teaching natural science is laid down. Meteorological content of various textbooks of physics is analyzed. The part of regional meteorologists is discussed. *Subject Heading:* **1. Teaching of meteorology.**—*C.E.P.B.*

## HISTORY

*See also:* **Physics of atmos.** Spasskiĭ), 7.10–2; **Hist. of met. services,** 7.10–31; **Forecasting in Canada** (R.M.S., Canadian Branch), 7.10–94.

7.10–33 551.5:91.04(98)

Regele, Oskar (*Vienna*), **Beiträge zur Geschichte des 1. Internationalen Polarjahres 1882 1883.** [Contribution to the history of the First International Polar Year 1882/1883.] *Polarforschung*, Kiel, Ser. 3, 22(1/2):188–192, 1952, pub. Aug. 15, **1954.** 20 refs. **DWB**—Carl Weyprecht 1838–1881) conceived the idea of the First International Polar Year and was the chief promotor until his untimely death at the age of 43, two years before the event. The present article gives a quantity of carefully documented background information on the events leading up to the 1882–83 undertaking, the number of countries participating (16), number of stations of various types, the part played by Austria and Germany and the work of Weyprecht, Wohlgemuth and others in preparing for the Year. *Subject Headings:* **1. International Polar Year, 1882–1883 2. History of Polar Year. I. Weyprecht, Carl.**—*M.R.*

## BIOGRAPHY

*See also:* **Physics of atmos., selected works** (Spasskiĭ), **7.10–2.**

7.10–34 551.5:92

Sutton, Sir Graham. **Sir David Brunt, born June 17, 1886: scholar, teacher, administrator.** *Meteorological Magazine*, London, 85(1008):161–164, June **1956.** photo. **DWB**—An account of his work on the occasion of his 70th birthday. He was trained at Aberystwyth and Cambridge as an applied mathematician, and applied mathematics is the basis of his meteorological work. An example is his treatment of the fall of temperature on a clear night. In 1934 he left the Meteorological Office to succeed Sir Gilbert Walker as Professor of Meteorology at the Imperial College, London; in the same year his **Physical and dynamical meteorology** appeared. He initiated the investigation of the mechanism of atmospheric diffusion at Porton. *Subject Headings:* **1. Biography 2. Brunt, Sir David.**—*C.E.P.B.*

7.10–35 551.5:92

Weickmann, Ludwig. **Gedächtnisrede für Geheimrat Prof. Dr. August Schmauss gehalten am 16. November 1954 in München.** [Speech in memory of Prof. Dr. August Schmauss. . . .] *Meteorologische Rundschau*, 8(1/2):1–6, Jan./Feb. **1955.** photo. Also: Zierl, H. and Schlegel, M., **Veröffentlichungen von A. Schmauss 1948–1954. Mit Nachträgen (+) zum Verzeichnis der Veröffentlichungen bis 1947 in Meteor. Rdsch. 1, 170(1946/47).** [Publications of A. Schmauss. . . .] *Ibid.*, p. 6–7. **MH-BH**—From 1901–05, as assistant to Röntgen, Schmauss wrote a number of physical works. In 1905 he joined the Royal Bavarian Meteorological Central Station, becoming director in 1910. This began a period of great activity in upper air investigation and forecasting. During the 1914–18 war he studied turbulence and other problems of military importance. In 1923 he took charge of the new Geophysical Institute at Leipzig and initiated the study of singularities. The list of his papers since 1940 includes 26 monographs, 15 short reports and 6 reviews. *Subject Headings:* **1. Biography 2. Schmauss, August.**—*C.E.P.B.*

7.10–36 551.5:92

Mazur, Jósef, **Prof. Edward Stenz [Obituary].** *Nature*, London, 177(4518):1014, June 2, **1956. DWB**—Born in Warsaw, died Feb. 21, 1956, at Stockholm, aged 56. Lecturer in physics at Warsaw University, later director of Observatory at Kasprowy Wierth and during the war in charge of meteorological office at Kabul. After the war Professor of Geophysics at Warsaw, President of Polish Geophysical Committee and of the Polish Meteorological and Hydrological Society. Author of about 90 papers on meteorological or geophysical subjects. *Subject Headings:* **1. Obituaries 2. Stenz, E.**—*C.E.P.B.*

## BIBLIOGRAPHY

*See also:* **Bibliog. of A. Schmauss** (Weickmann), 7.10–35.

7.10–37 550.3:061.3:160

**Note and bibliographical items relating to the International Geophysical Year.** *American Geophysical Union, Transactions*, 36(5):929–931, Oct. **1955. DWB, DLC**—In addition to the 18 bibliographical references, this note describes briefly the Brussels meeting of the IGY, Sept. 8–14, 1955. *Subject Headings:* **1. International Geophysical Year meetings 2. IGY bibliography.**—*I.L.D.*

7.10–38 551.5:52:016(09)

†**Progress Chekhoslovatskoĭ astronomii v 1945–1955 g.g.** [Progress of Czechoslovak astronomy from 1945–1955.] *Bulletin of the Astronomical Institutes of Czechoslovakia*, Prague, 6(3,4):41–64, 65–96, **1955.** bibliog. at end of each section. In Russian and English. **DLC**—Literature published in Czechoslovakia in the field of astronomy during the period 1945–1955 is reviewed in 8 sections (each written by different authors) with references (amounting to a total of some 300) at the end of each section. Information of meteorological interest is contained in the following sections (papers, in Russian & English): Bumba, V., **Fizika solntsa,** [Solar physics], p. 41–52 (106 refs.). Includes chapter on solar effects on the general circulation of the atmosphere and on the state of the upper atmosphere, with some 30 refs. Guth, V., **Meteornaia astronomiia,** [Meteoric astronomy], p. 65–76 (78 refs.) with chapters dealing with upper air density determination by means of meteors; meteoric ionization and meteoric dust in the atmosphere (23 pertinent refs.). Československá Akademie Věd. Astronomický Ustav, **Vysokie sloi atmosfery,** [The upper atmosphere], p. 76–82 (42 refs.). In this paper various astronomical techniques (used in Czechoslovakia) for research on the upper atmosphere are reviewed: namely, observation of the earth's shadow during lunar eclipses (ozone, meteoric dust); measurement of twilight spectra, and ionospheric soundings. Other sections are on: Celestial mechanics; Comets (with reference to Lınk's paper on correlation between discovery of comets in historic times and climatic changes); Astrometry; Stellar astronomy and Radio astronomy. *Subject Headings:* **1. Review articles 2. Progress in astronomy 3. Astronomy bibliographies 4. Czechoslovakia.**—*G.T.*

# APPLIED METEOROLOGY

## MARINE METEOROLOGY AND OCEANOGRAPHY

*See also:* **Trans-oceanic system for collecting met. data** (Mastenbrook, Anderson), 7.10–77; **Shipping warnings** (Rodewald), 7.10–110; **Albedo of sea surface** (Kondrat'ev, Kudriavtseva), 7.10–169; **Foaming of sea water** (Abe), 7.10–206; **Wind and surface drift** (Lawford), 7.10–207; **Insects at sea** (Seilkopf), 7.10–208; **Paleo temps. of Pacific bottom waters** (Bandy), 7.10–268.

7.10–39 551.465:551.507.2(261)

Barlow, E. W., **Five-year current means at Ocean Weather Stations I and J.** *Marine Observer*, London, 26(172):108–109, April **1956.** fig. **DLC**—Current roses are given for I (summer) and J (winter), both in the North Atlantic Current. The mean flow is 5–8.5 mi/day,

ightly to north of east. *Subject Headings:* **1. Ocean currents 2. Weather ship data 3. North tlantic.**—*C.E.P.B.*

7.10–40 551.54:551.556:551.46:532.59

Crease, J., **Propagation of long waves due to atmospheric disturbances on a rotating sea.** *oyal Society of London, Proceedings, Ser. A*, 233(1195):556–569, Jan. 10, **1956.** 5 figs., tables, 10 refs., 58 eqs. **DWB**—Long waves in shallow water in a nonrotating system are not ispersive but in a rotating system they are. This paper investigates the generation and ropagation of these dispersive waves in an infinite sea. The mode of generation is by air- ressure gradients or wind stresses applied to the surface. Bottom friction is neglected. The rface elevation due to a stationary force of constant amplitude suddenly applied and main- ined at $t=0$ over one-half of an infinite sea is shown to approach, through a series of oscilla- ons approximating more or less to an inertia period, a steady-state amplitude decreasing ith distance from the generating area. The longitudinal and transverse velocities are also iven. The time elapsed from the initial disturbance at a point to the first maximum of levation decreases with the distance of the point from the edge of the generating area. A enerating area whose edge moves forward with the maximum group velocity of the waves s shown to lead to an elevation of ever-increasing height. The effect of a barrier placed at ight angles to the direction of propagation is also briefly considered. *Subject Headings:* **. Ocean wave propagation 2. Pressure effects on sea level.**—*Author's abstract.*

7.10–41 551.506.3:551.507.2(261)

*Hay, R. F. M., **Five-year means of meteorological observations made at the Ocean Weather Stations I and J, 1948–52.** *Marine Observer*, London, 26(172):97–107, April **1956.** 0 tables, 3 refs. **DLC**—Summaries of observations at 8 synoptic hours are given for the mean ositions 59°N 19°W and 52½°N 20°W. They include: Mean monthly wind velocity (with other windy stations for comparison; only Adélie Land is windier), means and extremes of ressure, gales from different directions, air and sea temperature and dew point, days of weather henomena and frequencies of visibility. The accuracy of observations is discussed. Diurnal anges are given. *Subject Headings:* **1. Weather ship summaries 2. Weather Ship "Item" 3. Weather Ship "Jig."**—*C.E.P.B.*

7.10–42 551.5(26)

†Kuhlbrodt, E.; Rodewald, M.; Bullig, H. J. et al., **Zur Arbeit in der maritimen Meteorologie.** [Research work in maritime meteorology.] *Meteorologische Rundschau*, Berlin, (3/4):47–55, March/April **1956.** 32 refs. **DLC**—The importance of the sea in meteorology s stressed. Observations at sea are more difficult than on land; suggestions for improvement are methods of minimizing the disturbing effect of the ship, measurement of precipitation and nvestigation of the sea-air interface. Statistical treatment of marine climatological observa- tions is discussed. Applications of marine meteorology include navigation, fisheries, ice drift, cargo meteorology, etc. Finally, marine synoptic work is discussed. *Subject Headings:* **1. Marine meteorology. I. Roll, H. U. II. Seilkopf, H.**—*C.E.P.B.*

7.10–43 551.509:639.2

Parczewski, Władysław, **Osłona meteorologiczna połowów dalekomorskich.** [Meteorological protection of sea fishery.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, 7(1/2): 45–51, **1954.** 2 tables. **DWB, DLC**—The organization, equipment, program and working schedule of a small weather station organized in 1953 on the initiative of the Central Bureau of Forecasting, PIHM, on board a supply and depot ship of a herring fishery flotilla during the fishing season (1953) in the North Sea (from 58°N, 2°W to 52°N, 2°E) with the aim of readjusting weather and synoptic information broadcast by English stations and those of other countries adjacent to the North Sea, to local conditions of the fishing grounds, are described and discussed. The local weather forecasts worked out at the station are based only on those meteorological elements which influence directly the work of the crews, namely—velocity of surface winds, visibility and general characteristics of the weather. In view of the fact that the best fishing areas are situated on the main path of low pressure movement they are

very stormy and therefore a timely warning of changes is very important. *Subject Headin* **1. Marine forecasting 2. Fishing industry 3. North Sea.**—*A.M.P.*

7.10–44 551.465.

*Rouch, Jules A. P., **Bottle papers.** *Institut Océanographique*, Monaco, 51(1046), July **1954.** 3 p. 2 figs., table, 2 refs. In French. **DWB**—A tabulation and analysis of d from 56 bottles launched in the North Atlantic (1947–52) and recovered on the coast of Fra (Bay of Biscay and Brittany) reveals the wide range in effective wind and current conditi which is evident from the different durations, speeds and distances, and directions of tra of the bottles. Seasonal factors are evident in monthly and annual analysis of recoverie more in winter than in summer (the same is true of Japanese (glass) fishing floats on Wa ington and Oregon coast of U. S.). *Subject Headings:* **1. Bottle papers 2. Ocean drift measu ments 3. Biscay Coast, France 4. North Atlantic.**—*M.R.*

## ASTRONAUTICS—SATELLITE OBSERVATORIES

7.10–45 551.507.36:629

Aujeszky, László, **A "mesterséges hold" létesítésének meteorologiai kérdései.** [M teorological aspects of artificial satellites.] *Időjárás*, Budapest, 59(5):312–313, Sept./O **1955. DLC**—The practical meteorological value of an instrument-carrying artificial satell traveling around the earth at some 400 km altitude for several days or weeks is believed to considerable in the field of radiation measurement. The author does not believe, howev that cloud photographs from such a height (as suggested by I. Almár, Sept. 13, 1955) wou be likely to improve existing forecasting techniques. Such photographs would only duplica information now provided on synoptic weather maps. Moreover, the future state of cloudin must be forecast from the physical state of the atmosphere rather than from prevailing clo conditions. *Subject Heading:* **1. Satellite observatories.**—*G.T.*

7.10–46 551.507.36:629.

Ovenden, Michael W., **The astronomical uses of small artificial satellites.** *Scien Progress*, London, 44(175):472–479, July **1956.** refs. **DWB**—The artificial satellite proje is discussed. Satellites could give data of density of atmosphere at heights of 100–300 m improve geodetic and gravity data, measure electric current-density in the ionosphere especia during solar flares, and give data of primary cosmic radiation and the solar spectrum. T power problem may be solved by solar batteries; other technical problems are discuss *Subject Heading:* **1. Satellites observatories.**—*C.E.P.B.*

7.10–47 551.507.36:629.

Porter, J. G., **M.O.U.S.E.** *Institute of Navigation, London, Journal*, 9(3):335–3 July **1956.** Discussion p. 336–337. **DWB**—Account of "Minimum Orbital Unmann Satellite Earth," its instrumentation and orbit. The discussion was concerned with difficulti *Subject Headings:* **1. Satellites observatories 2. MOUSE observation.** —*C.E.P.B.*

## AERONAUTICAL METEOROLOGY

*See also:* **Met. for aircrew** (Gt. Brit. R.A.F.), 7.10–13; **Flight info. manual** (U. S. Off. Aviation Develop.), 7.10–14; **Single heading flight** (U. S. Off. Res. & Inventions), 7.10–15 **Visibility studies** (U. S. W. B.), 7.10–280.

7.10–48 551.589.5:656.71(512.31

*Baker, E. T. (*Met. Office*), **Analysis of low cloud and poor visibility at Hong Kong Airpo 1949–1954.** *Hong Kong. Royal Observatory, Technical Note*, No. 11, Sept. **1955.** 99+ 84 tables. **DWB**—Article is based on hourly ceiling and visibility data for Hong Kong Ai port for period Jan. 1, 1949 to Dec. 31, 1954 (½ hourly from Aug. 1, 1949 through 1954 Spells of 1 hr or more of bad weather (low ceiling and/or visibility) totaled 1972 hrs or abo 4%, but March had 17 times as many hours as Oct. (423 vs. 25), and March 1951 had 111 h

npared with 25 in March 1954. Feb., March and April provided nearly 50% of the 474 s with a "spell." Poor conditions occurred on 6.5% of morning hours, 3.2% of afternoon 2.4% of night hours. Longest spell was 21 hrs and average 2.6 hrs in a.m. and 2.1 hrs .m. Spells of visibility <3 mi totalled 1802 hrs and of ceilings <800 ft 417 hrs and to- her in 247 hrs. Detailed seasonal and monthly summaries occupy 100 pages and elaborate tingency tables (for year and each month) of all kinds, occupy over 80 pages. *Subject adings:* **1. Ceiling and visibility data 2. Hong Kong Airport, Hong Kong.**—*M.R.*

7.10–49 551.513.2:551.557:629.13

§Bannon, J. K.; Frost, Bernard C. and Kirk, T. H., **Some meteorological aspects of high- el navigation.** *Institute of Navigation, London, Journal*, 9(3):282–309, July **1956.** Con- ts: Bannon, J. K., **Strong winds in the upper atmosphere above 15,000 ft.** p. 282–288. igs., 6 refs. Frost, Bernard C., **Jet streams and the pilot.** p. 288–293. 18 figs. (some or). Kirk, T. H., **The problems of forecasting.** p. 293–305. 12 figs., ref. **Discussion.** 305–309. fig. **DWB**—Bannon summarized information about jet streams. In tem- rate latitudes they are associated with frontal systems of depressions, are 1–300 mi across h axis about 30,000 ft. The subtropical jet is from a westerly point, about 500 mi across th axis about 40,000 ft. In midwinter there are strong westerlies above 45,000 ft near ctic and Antarctic circles. In 10°N strong easterlies cross the Indian Ocean and Africa in ne through Aug. at 47,000 ft. Jet streams are associated with local areas of turbulence. ost gave photos of jet stream clouds and described structure and in-flight location and ecasting of jet streams and their use to save flying time. Kirk described experiences and chnique in routine forecasting at London Airport with synoptic charts and comparisons of served with forecast winds at 200–300 mb. over the North Atlantic. Suggestions are made improving forecasts. A good discussion followed. *Subject Headings:* **1. Aerial navigation Jet stream 3. Upper air winds.**—*C.E.P.B.*

7.10–50 551.589.5:656.71(92)

*Indonesia. Djawatan Meteorologi dan Geofisik, Djakarta, **Meteorological data of donesian Aerodrome, 1950.** pub. **1952.** 166 p. almost entirely tables. **DWB**—This nual report gives for 23 stations the following observational data: frequency of surface nds, frequency of horizontal visibility, frequency of heights of low clouds, frequency of esent weather such as rain, drizzle, fog, thunderstorm and simultaneous occurrence of clouds. *bject Headings:* **1. Airport landing conditions 2. Indonesia.**—*I.L.D.*

7.10–51 551.557:629.13(261)

Willis, D. C., **Practical navigation over the North Atlantic.** *Institute of Navigation, ondon, Journal*, 9(3):310–322, July **1956.** 7 figs., ref. **DWB**—The method of plotting ast time flight track is set out, using upper air charts. Use of the jet stream is described. lying aids are referred to and the problem of growing air traffic density is considered. *Subject eadings:* **1. Aerial navigation 2. Jet stream 3. Upper air winds 4. Flight plans.**—*C.E.P.B.*

## AGRICULTURAL METEOROLOGY

*See also:* **Climate and soil** (Lundegårdh), 7.10–6; **Shed microclimatology** (Raeuber), 7.10–273.

7.10–52 551.506.8:633.1

*Bates, R. P. (*Noble Foundation, Ardmore, Okla.*), **Climatic factors and corn yields in exas Blacklands.** *Agronomy Journal*, Madison, Wisc., 47(8):367–369, Aug. **1955.** 3 tables, refs. **DLC**—To obtain a better understanding of climatic factors limiting corn yields, orrelation coefficients were calculated between several climatic factors and corn yields during 41-year period from 1913 through 1953. Mean maximum temperature, mean relative umidity, and evaporation in June (the month in which corn is usually pollinated) were very losely correlated with corn yields. These three factors were closely correlated with each ther, and since evaporation is dependent on temperature and humidity, the latter two factors ppear to be those affecting corn yields. Each of these factors was more closely correlated

with corn yields than was rainfall at any period of the year. The number of rains in showed a higher correlation with yield than did any other rainfall factor. Rainfall in was correlated more closely with yields than total rainfall during any other period. If ra during more than 1 month was considered, the period from Oct. 1 to Aug. 1 showed the hig correlation with yields. Number of cloudy days in June was not closely correlated with yields and the correlation which existed was probably due to effects of rainfall, humidity, temperature. *Subject Headings:* **1. Agricultural meteorology 2. Climate and crop 3. Corn phenology 4. Temple, Texas.**—*Author's abstract.*

7.10–53 551.524:63

Geslin, H. (*Inst. Nat. de la Recherche Agron.*), **Influence de la température sur le tal épi du blé.** [Influence of temperature on the rate of growth of wheat.] *La Météorol* Paris, Ser. 4, No. 36:301–307, Oct./Dec. **1954.** 3 figs., eqs. French, English and Ita summaries p. 301. **DWB**—A law of the action of temperature on the rate of developmer wheat is introduced. This specific action of temperature which comes into play in the nomenon of vernalization does not affect as much the growth of the plant itself as its ab to produce a more or less large number of stalks with ears. The law is then applied to "head tally," i.e., the number of ears per sq m at the harvest. *Subject Headings:* **1. T perature effects on crop yield 2. Wheat yield.**—*A.M.P.*

7.10–54 551.5:061.1:63(C

Great Britain. Meteorological Office. Agricultural Branch, **Weather and the la** *Great Britain. Ministry of Agriculture, Fisheries and Food, Bulletin*, No. 165, **1955.** 4+3 14 figs., 4 plates. **DA**—This handbook opens with a description of the climate of Brit including maps of average rainfall, synoptic charts illustrating weather types, Jan. and J temperatures and dates when sea level temperature rises above 42°F. Ch. 2 deals with lo variations due to altitude, distance from the sea, slope, aspect and soil temperature. Ch deals with glass houses, shelter belts, irrigation, protection against frost and influence of weat in general on farming. In Ch. 4 hints are given to farmers to interpret official forecast make their own. Finally, Ch. 5 deals with forecast districts, definitions and classificat of frost according to wind and temperature. *Subject Headings:* **1. Agricultural meteorol 2. Handbooks.**—*C.E.P.B.*

7.10–55 551.577:633

Mallik, A. K. (*Met. Off., Poona*), **Pre-sowing rainfall and the germination of the wh crop.** *Indian Journal of Meteorology and Geophysics*, New Delhi, 6(4):361–363, Oct. 19 ref. **DWB, DLC**—The relationship between the rainfall before sowing time and the germi tion count of the wheat crop was investigated at a network of selected stations in India, recording the total rainfall during the 4 and 6 week period preceding the sowing week a calculating correlation coefficients between rainfall and germination percentage. Significa correlation coefficients, +0.54 and +0.58, were obtained. *Subject Headings:* **1. Rainfa wheat germination correlations 2. India.**—*I.L.D.*

7.10–56 631:551.577

Owen, P. C. and Watson, D. J., **Effect on crop growth of rain after prolonged drough** *Nature*, London, 177(4514):847, May 5, **1956.** table. **DWB**—Observations were made of t effect of irrigation on sugar beet crop at Woburn, Eng., in 1955. On Aug. 10 no rain h fallen for 5 weeks and water deficit on unirrigated plots was 5". Dry weight, leaf area a growth rate were much greater on irrigated than unirrigated plots. In next 2 weeks 0. rain fell and although water deficit increased to 6", the unirrigated crops grew faster than t irrigated ones, without however making up the deficit. *Subject Headings:* **1. Rainfall effec 2. Sugar beet yield 3. Woburn, Eng.**—*C.E.P.B.*

7.10–57 551.5:633.1

Pintér, László, **Az őszibuza termésátlagának osszefüggése a főbb meteorológiai té yezőkkel.** [Correlation between the average crop of winter wheat and the principal meteor logical factors.] *Időjárás*, Budapest, 59(4):193–203, July/Aug. **1955.** 11 figs. Russia

French summaries p. 193. **DWB, DLC**—The correlation of the principal meteorological ents (temperature, sunshine duration, precipitation) and certain farming operations with age wheat crop is analyzed for central Hungary for the period 1920–1954. A correlation or of $R=0.889\pm0.025$ is found which is considered sufficient for fairly accurate prediction ops. *Subject Headings:* **1. Climate and crop yield 2. Wheat yield 3. Hungary.**—*Trans. uthor's abstract.*

7.10–58 551.311:631.4

Stübner, Kurt, **Luftaufnahmen-Diagnostik erosionsgefährdeter Agrarböden.** [Air- ographic diagnosis of erosion danger to agricultural soils.] *Umschau*, Frankfurt a.M., 2):370–373, June 15, **1956.** 7 photos, 5 refs. **DLC**—Soil erosion by rain and wind is cially active in spring and fall, outside the vegetation period. Photographs in central many show erosion by heavy rain, which can remove several cm of top soil, and wind. Two photographs show well developed and incipient erosion. Preventive measures are listed. *ject Headings:* **1. Soil erosion 2. Germany.**—*C.E.P.B.*

## FOREST METEOROLOGY

*See also:* **Inexpensive rain gauge** (Berry, Berg), 7.10–85.

7.10–59 551.577.52:634.9

Ovington, J. D., **A comparison of rainfall in different woodlands.** *Forestry*, London, .):41–53, **1954.** 4 figs., 2 plates, 5 tables, 12 refs. Abstracted in *Biological Abstracts*, 13017, June **1955. DLC**—Adjacent forest plots at Bedgebury, Kent, were planted in )–32 with 11 different species, forming close canopies, with 3 open plots for control. Mean ual rainfall 33″. Rainfall and drippings under the trees and water flowing down trunks e measured and numbers of drops of different sizes counted; 25–68% of rain fell as drops er than those in the open. Canopies retained 6–93% of rainfall. Yearly totals ranged a 77% under *Larix eurolepsis* to 46% for *Pseudotsuga taxifolia*. Flow of water down ks was very small. Snowfall under deciduous trees in winter was up to 70% of that in n, under evergreens small or absent. *Subject Headings:* **1. Forest rainfall 2. Bedgebury,** .—*C.E.P.B.*

## INDUSTRIAL METEOROLOGY

*See also:* **Met. protection of fishing industry** (Parczewski), 7.10–43; **Met. influences on industrial waste gases** (Löbner), 7.10–122.

7.9–60 551.524.36:551.583.15

*de Mey, C. F. (*Columbia Gas System*), **Memorandum on atmospheric temperature varia- s.** Jan. **1954.** 13 p. chart, foot-ref. Mimeo. **DWB**—A chart shows average heating son (Oct. through April) temperatures each year for 61 years (1892–1953) for 3 states, na., Ohio and West Va. Three lines are drawn—one, the 61-year average; next, the rage for the last 30 years and, finally, a continuous curve or trend line. The latter shows se of 1.9°F during the 61 yrs, so that at the end it is 0.8°F warmer than the long period mal and 0.3° warmer than that for the past 30 years. The remarkable thing, however, is this apparent slow warming of .03°/yr, but the tremendously greater year to year variation ch sometimes amounts to over 6.0°F or 200 times the smoothed trend and on the average ° or 3°F or 100 times as great. Also the distribution is skewed, the cold years being very d, but not so frequent as the above normal years, though more frequent than the very warm rs. Discussion of short, medium and long range forecasting and statistical analysis of g period records is included. *Subject Headings:* **1. Temperature trends 2. Long period ords 3. Temperature normals 4. Degree-day data 5. Ohio 6. Pennsylvania 7. West ginia.**—*M.R.*

7.10–61 551.5:69

National Research Council, Wash., D. C. Building Research Advisory Board, **Study conservation in building construction performed by the Building Research Advisory Board.**

**Final report, June 30, 1952.** Wash., D. C., **1952.** Summary, 23 p.+107 p. of text+App[...] of 103 p. Occasional bibliographies. **DWB**—On p. 90 and 91 of this comprehensive r[...] on all aspects of building construction economy are recommendations concerning air condi[...] ing: Par. 10.1 "Design Data–urge ASH & VE to review and amplify the existing sur[...] climatic data given in the ASH & VE Guide," and Par. 11.21 "Urge the U. S. Weather Bu[...] to prepare winter and summer weather data which is especially arranged for use by the h[...] ing industry," and "the Panel recommends that the building industry and interested ass[...] tions stress the urgency for weather data by presenting to the U. S. Weather Bureau[...] economic factors in building construction which are directly dependent on climatolo[...] factors." *Subject Headings:* **1. Building construction 2. Air conditioning weather data.**—*J.*

7.10–62 551.515.4:551.594.221:621.311(

*Prentice, S. A. (*Prof. of Elec. Engr., Queensland Univ.*), **Thunderstorms in relatio[...] electricity supply in Queensland.** *Institution of Engineers of Australia*, Sydney, 27(4/5)[...] 108, April/May **1955.** 17 figs., 4 tables, 17 refs. **DLC**—Data on thunderstorm frequ[...] obtained in Australia, England and the U. S. are analyzed and discussed critically from[...] point of view of the use of such data for transmission line design or protection. Thun[...] storm days must be converted into lightning stroke frequency and intensity. A new su[...] at 300 stations in Queensland embraces more detailed observations of duration and numb[...] strokes, etc. than standard reporting procedures have accomplished. Histograms show[...] sonal, diurnal, and year to year variation in number of thunderstorms at several place[...] Queensland, and table of data to support these presentations. Direction of movemen[...] also shown on charts. Data on actual number of lightning breaks on transmission lines g[...] an isoceraunic level much lower than the isobronts indicate. This may be due to the fact[...] not all strokes cause insulation breaks or even strike transmission lines but the data are u[...] as they are directly related to desired information. *Subject Headings:* **1. Thunderst[...] frequencies 2. Lightning damage to transmission lines 3. Queensland, Australia.**—*M.A.*

7.10–63 620.197:5[...]

Schikorr, Gerhard, **Stand der Erforschung der Metallkorrosion.** [Position of inves[...] tion of metal corrosion.] *Naturwissenschaftliche Rundschau*, Stuttgart, 9(5):193–199, [...] **1956.** 6 figs., 13 refs. **DWB**—Corrosion is one of the greatest problems to-day (6 [...] references every day). In water pipes it is of 2 kinds, resulting in perforation and block[...] Corrosion of lead and zinc causes damage to health. The electrochemical processes invo[...] are described. The presence of chlorides, especially NaCl, forms soluble products and a[...] erates corrosion. In Germany, rusting of iron is greatest in Berlin and other cities (du[...] pollution, greatest in winter) and in Heligoland (due to salt, greatest in summer). In[...] tropics, rusting is less than in England (according to J. C. Hudson). Other causes of corro[...] are briefly considered. *Subject Heading:* **1. Corrosion of metals.**—*C.E.P.B.*

## MEDICAL METEOROLOGY

*See also:* **Retention of condensation nuclei in respiratory tract** (Verzár), 7.10–93; **Meteorology and hay fever** (Dingle), 7.10–118; **Medical met. and radiation physics of UV radiation** (Schulze), 7.10–174.

7.10–64 613.692(2[...]

†Abs, Otto, **Neues aus der Polarmedizin, I.** [More about polar medicine, Pt. 1.] *Po[...] forschung*, Kiel, Ser. 3, 24(1/2):273–280, **1954,** pub. 1956. 19 refs. Also 66 refs. for previ[...] article: **Kälteschädigungen auf Polarexpeditionen.** (*See* 6.5–301, May 1955, *MAB.*) **DW**[...] A number of investigations by doctors and others into psychological disturbances such[...] Stefansson's "Arctic hysteria" are discussed; some men (psychopaths) are peculiarly lia[...] to them in polar winters. They may be intensified by food deficiencies and over-cool[...] Analogous is "Arctic dog disease." Arctic trichinosis generally arises from eating infec[...] Arctic mammals. Need of Arctic travellers in calories is discussed. To be continued. *S[...] ject Heading:* **1. Polar medicine.**—*C.E.P.B.*

7.10–65 616.925:551.5

Lawrence, E. N., **Poliomyelitis and weather.** *Meteorological Magazine*, London, 85(1008): 167, June 1956. fig., 4 refs. **DWB**—No definite relation between polio and climate has proved, but association with a continental type has been suspected. Researches in in are summarized. The number of days after April 1 when cases reach a maximum 03t+138, where t is the number of days after April 1 when the mean temperature reaches . Some tentative conclusions by C. E. P. Brooks and by W. H. Bradley and A. E. MMOND also favor spells of hot dry weather as one cause. *Subject Headings:* **1. Polio-itis 2. Weather effects.**—*C.E.P.B.*

# METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

## METHODS OF OBSERVATION

*See also:* **Transosonde** (Anderson, others), 7.10–80; **Rocket method of determining upper atmos. properties** (Groves), 7.10–126; **Variations of atmos. ozone with height** (Epstein, others), 7.10–128; **Jet exploration by aircraft** (Saucier, Riehl), 7.10–155; **Large scale climatic charts** (Knoch), 7.10–231; **Scattering by nonisotropic irregularities** (Booker), 7.10–297.

7.10–66 551.501:532.72

Hay, J. S. and Pasquill, F., **A technique for studying the local atmospheric diffusion of orne material.** *Great Britain. Meteorological Research Committee, M.R.P.* 961, Dec. 6, 5. 6 p. 5 figs., 6 refs. Mimeo. Also issued as: *Porton, England. Chemical Defence perimental Establishment, Porton Technical Paper*, No. 527, Dec. 6, **1955.** 6 p. 4 figs. l. photo), 6 refs. **DWB**—Spores of Lycopodium fall from a hopper through a channel o the blades of a high-speed fan, the output being 3 g/min at 32.5 m above ground. They collected on 2″ lengths of ¼″ glass cylinders coated with glycerine jelly and exposed vertically vanes at intervals on the cable of a balloon. The deposit on the tube is scanned with a roscope; collection efficiency is 41–44%. Inclination of wind is measured with a hot-wire mometer or horizontal vane. Results of 4 experiments showing distribution of spores up 10 m height 50 m downwind from source, and one up to 500 ft height 100 m downwind are cussed. *Subject Heading:* **1. Diffusion measurement.**—*C.E.P.B.*

7.10–67 551.501.3:551.521.4:551.594.5

Hunten, D. M.; Roach, F. E. and Chamberlain, J. W., **A photometric unit for the airglow 1 aurora.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(6):345–346, June 56. table, 5 refs. **DWB**—The quantity measured is the angular surface brightness $B$ but quantity required is the volume emission rate, which is ordinarily $4\pi B$. It is proposed t the unit of photometric measurements should be the "rayleigh" $R=4\pi B=10^6$ quanta/ $^2$(column) sec. Some typical values are given. *Subject Headings:* **1. Night sky brightness asurement 2. Auroral luminescence 3. "Rayleigh" $R$ unit 4. Units.**—*C.E.P.B.*

7.10–68 551.501.4:551.506.7:551.521.32

*Lönnqvist, Olov, **Measurements of effective radiation at Bromma Airport simultaneous h radiosoundings.** *Arkiv för Geofysik*, Stockholm, 2(15):371–376, **1955.** 3 tables, 4 refs., s. Also issued as *Uppsala. Universitetet. Meteorologiska Institutionen, Meddelande*, No. 3. **DWB**—Using an Ångström electrical compensation pyrgeometer with a constant of 6.7 talled on the roof of the Bromma Airport, Stockholm, and routine radiosoundings made at omma at 0330 local time, between April 10 to Aug. 5, and Sept. 20 to Oct. 10, 1954, on 8 t of 14 cases when the sky was clear at the hour of sounding, the author calculates and esents in tables the values for the meteorological and radiation parameters, including 4 ferent constants, to see which constants give the best agreement between observed and imated relative net nocturnal radiation. A table gives the standard deviation $\sigma$ of this ference according to 16 different procedures, i.e., formulas or charts (Elsasser, Möller, nnqvist, Robinson, Yamamoto, Raethjen, Brunt, Brooks, Ångström, etc.). Previous values for the same formulas are given in brackets, as calculated by the author in his 1954

paper (*Ibid.*, 2(12):245–294, **1954**; *see* 7.3-86, March 1956, *MAB*), showed that the me which neglected $CO_2$ radiation were the best. The present calculations show that those do consider $CO_2$ radiation have the smallest $\sigma$ (empirical constants 0.6, Elsasser 0.8, M 0.9, Brunt formula 2.1). Assuming an R.H. of 60% at all heights, a value of 21.1 is for an average of the standard relative net radiation for the 8 cases. This value is lower most theoretical and observed values, but lies within the extreme ranges (18-33) of those va *Subject Headings:* **1. Nocturnal radiation calculations 2. Ångström pyrgeometer observa 3. Bromma Airport, Stockholm, Sweden.**—*M.R.*

7.10–69 551.501.6:551.510.535:621.

Bibl, K., **Automatic recording of ionospheric characteristics.** *Journal of Atmosp and Terrestrial Physics*, London, 8(4/5):295, May **1956**. fig., 3 refs. **DWB**—Descri method of transforming the normal record of an ionogram into a direct record of the M *Subject Headings:* **1. Ionograms 2. Ionospheric absorption calculation.**—*C.E.P.B.*

7.10–70 551.501.81:551.

Dyce, R. B. (*Geophysical Inst., College, Alaska and Cornell Univ., Ithaca, N. Y.*), **Au echoes observed north of the auroral zone on 51.9 Mc/sec.** *Journal of Geophysical Rese* Wash., D. C., 60(3):317–323, Sept. **1955**. 3 figs., 9 refs. **DLC**—During Nov. 1954, a si radar system designed for observation of auroral echoes at 51.9 Mc/sec, was operated at B Barrow, Alaska. Because this location is north of the accepted maximum of the au zone, most of the visible aurora is seen to the south of the observing station. The radar a continuously-rotating antenna to see with equal sensitivity in all directions, but more 90% of the echoes were obtained from directions north of east and west. Echoes were tained only from 500 to 1100 km. These effects are explained by the theory of Moor enlarged by Booker, Gartlein, and Nichols, requiring near-perpendicularity of radio paths to the lines of the earth's magnetic field. During visible aurora, propagation at Mc/sec was investigated over an 800 km path from College to Barrow, across the auroral z Bursts of signal due to meteor ionization were readily observed. Propagation associated v aurora was almost nonexistent, even with visible aurora at the mid-path. If the theor auroral echoes of Harang and Landmark were true, auroral propagation should have b readily detected. *Subject Headings:* **1. Radar echoes from auroras 2. College, Alask** *Author's abstract.*

7.10–71 551.501.81:551.5

McNamara, A. G. (*Saskatchewan Univ., Saskatoon, Canada*), **Double-Doppler ra investigations of aurora.** *Journal of Geophysical Research*, Wash., D. C., 60(3):257– Sept. **1955**. 7 figs. (incl. photos), 11 refs. **DLC**—A pulsed double-Doppler radar techni has been employed to study the 90.7 Mc/sec signals reflected from auroral ionization. spectrum analyzer was used in conjunction with the radar to measure the power spectra of auroral echoes. The Doppler data are compared with observations of the visible aurora a with simultaneous echoes on 56 and 106 Mc/sec non coherent high-resolution radar equipme An interpretation of the Doppler data is given, and several theoretical models of the reflect mechanism are examined in terms of their effect on the observed spectra. *Subject Head* **1. Radar echoes from auroras.**—*Author's abstract.*

## OBSERVATIONAL DATA

*See also:* **Glazed frost** (Brooks), 7.10-7; **Dew measurement** (Gelbke), 7.10–10; **Balaena expedition** (Lamb), 7.10–11; **Climatic factors and corn yield** (Bates), 7.10–52; **Effective radiation measurement** (Lönnqvist), 7.10-68; **Rocket data** (Newell), 7.10–81; **Met. influence on industrial waste gases** (Löbner), 7.10–122.

7.10–72 551.506.1

*Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologisc Dienst, **Deutsches Meteorologisches Jahrbuch, 1943, Teil 4, Heft 1, Beobachtungen**

rvatoriums Potsdam. [German Meteorological Yearbook, 1943, Pt. 4, Sec. 1, Observa- at the Potsdam Observatory.] Berlin, Akademie-Verlag, **1955.** 93 p. almost entirely s. **DWB**—Contains 3 times daily (7, 14 and 21h) observations of pressure, temperature, pressure, relative humidity, wind, visibility, cloudiness (0–10), precipitation and snow at 7 h each day for Potsdam with an annual summary giving frequency of wind force ) by 8 directions, 5-day means or sums of most elements (including sunshine), and actual o-, litho- and electrometeors. Hourly data from recording instruments are given by months ressure, temperature, volume pressure, relative humidity, wind speed, precipitation, ine, cloud, soil temperature at 2, 5, 10, 20, 50, 100, 200, 400, 600 and 1200 cm (3 times a o 50 cm, 14 h for 1–12 m), evaporation, water content of snow, and intensity of direct ine, hourly heat of solar radiation, and global and diffuse radiation in g cal/cm². (*See* 8, May 1953, *MAB* for abstract for 1939 and 1950 issues.) *Subject Headings:* **1. Observa- l data 2. Annual meteorological data summaries 3. Soil temperature data 4. Solar tion data 5. Potsdam, Germany.**—*M.R.*

7.10–73 551.506.1 (43)

Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer st, **Deutsches Meteorologisches Jahrbuch, 1954, Teil 4, Heft 2, Beobachtungen des eorologischen Observatoriums Wahnsdorf.** [German Meteorological Yearbook, 1954, Pt. c. 2, Observations at the Wahnsdorf Meteorological Observatory.] Berlin, Akademie- ag, **1955.** 138 p. almost entirely tables. **DWB**—Extensive tabulation of 3 times daily rvations of all meteorological elements usually reported from synoptic stations, plus o-, litho- and electrometeors, and hourly pressure, temperature, vapor pressure, relative idity, sunshine, cloud amount, precipitation, wind direction and speed at 25 m and 2.5 m e ground; cooling power, soil temperature at 2, 5, 10, 20, 50, 100, 150, 200 and 250 m h (4 times a day at <1 m) at 2 stations (Kies and Rosen); intensity of direct sunshine in in with and without filters; hourly heat of global and diffuse sunshine; ozone measurements, nes a day at surface at Wahnsdorf and Fichtelberg, atmospheric electric potential gradient, conductivity data for each hour and monthly and annual summaries. (*See* 5.3–57, ch 1954, *MAB* for abstract for 1951 issue.) *Subject Headings:* **1. Observational data nnual meteorological data summaries 3. Yearbooks 4. Soil temperature data 5. Solar ation data 6. Cooling power data 7. Ozone data 8. Atmospheric electricity data Vahnsdorf, Germany.**—*M.R.*

7.10–74 551.506.7 (43)

*Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer nst, **Deutsches Meteorologisches Jahrbuch, 1954, Teil 5, Heft 1, Höhenwindmessungen reifswald, Lindenberg, Dresden, Wernigerode und Leipzig-Mockau.** [German Meteoro- cal Yearbook, 1954, Pt. 5, Sec. 1, Upper wind observations made at Greifswald, Lindenberg, sden, Wernigerode and Leipzig-Mockau.] Berlin, Akademie-Verlag, **1955.** 95 p. almost irely tables. **DWB**—Actual upper air winds by months each day in the month for 5 stations. ical observations of radiosondes (2 times a day) at 4 stations and pilot balloon observations ce a day. Occasional observations at Leipzig-Mockau are included. No monthly or ual summaries are included. (*See* 4E–235, May 1953, *MAB* for abstract for 1951 issue.) *ject Headings:* **1. Upper air wind data 2. Yearbooks 3. East Germany.**—*M.R.*

7.10–75 551.506.7 (058) (439.1)

*Hungary. Orszagos, Meteorologiai Intézet, **Evkönyvei.** [Annals], Vol. 1, 1871–. est issue seen, V. 84, 1954, pub. Budapest, **1955.** Annual. Issues for 1871–1896 and 6–1938, and 1949, in 1 vol. per year. 1897–1915 in several vols. 1950– in 2 vols. (V. 1, matological observations, V. 2, Aerological observations). **DWB**—In the earlier years the lication varied in format—sometimes all the data were published in one volume, and other es in several volumes. Starting with 1954, the data for the surface and the upper air for new Budapest Observatory, and upper air wind data for 8 stations in Hungary are published a separate volume (*see* 7.1–139, Jan. 1956, *MAB*). In the 1950–53 yearbooks, these data peared in Pt. II of the series. The present volume (V. 84 for 1954) consists of 4 parts: I, Observations at 1st, 2nd and 3rd order stations in Hungary: Ch. 1, contains daily (7, 14

and 21 h) synoptic observations at 4 stations (Budapest, Szombathely, Kalocsa and Keke
Ch. 2, monthly and annual summaries of all standard elements for 91 stations (2nd
and briefer summaries for 40 third order stations. Ch. 3, contains monthly anomalies
temperature (absolute monthly maximum and minimum temperatures) from 30 year
1930) normals for 60 stations and from 50 year (1901–50) normals for 30 stations.
(5-day) means are given for 126 stations, and 5-day anomalies for 11 stations. Pt. II c
of hourly values of pressure, temperature, relative humidity, wind direction and spee
cipitation and sunshine for Budapest; hourly wind direction frequencies for 2 statio
wind speed for 13 stations. Pt. III gives daily precipitation for 120 stations, monthly
maries of air masses and weather, with rainfall and rainfall anomaly charts, monthl
annual maximum precipitation data and number of days with precipitation for abou
stations, data on heavy precipitation for short periods, daily snow depths at 80 station
IV contains agrometeorological data: daily radiation minima at 5 cm (8 stations),
monthly and absolute minimum at 5 cm and number of days $\geq 0°C$ for 40 stations; freq
and extreme dates of minima $\geq -10°, 0°$; maximum $\geq 0°, \geq 25°, \geq 30°, \geq 35°C$; (130 sta
mean monthly and annual soil temperature at 0, 2, 5, 10, 20, 50, 100, 150 and 200 c
stations); mean 5-day soil temperature at same depth for 9 stations and phenological
(125 stations). *Subject Headings:* **1. Annual meteorological data summaries 2. Upp
data 3. Annual aerological data summaries 4. Hungary.**—*M.R.*

7.10–76 551.506.7:55

*Serra, Antonio, **Su una serie di osservazioni aerologiche dell'alta troposfera e
stratosfera interessanti il Mediterraneo Occidentale.** [A series of aerological observa
of the upper troposphere and the lower stratosphere affecting the Western Mediterran
*Rivista di Meteorologia Aeronautica*, Rome, 15(1):53–57, Jan./March, **1955.** 17 refs. Fr
English and German summaries p. 53. **DLC.** (Also: Italy. Servizio Meteorologico dell'
nautica, **Il Servizio Meteorologico dell'Aeronautica Italiana alla X Assemblea Gen
U.G.G.I., Rome, 1954.** p. 75–78. tables, 17 refs. English summary p. 75.) (Als
I.U.U.G. Association of Meteorology, Rome, Sept. 1954, **Scientific Proceedings.** Lon
Butterworth, **1956.** p. 305–309. 17 refs. Eng. summary p. 305. **DWB**—Two s
of aerological soundings were carried out near Elmas Air Base during the summer m
of 1952 and 1953. Large size polyethylene balloons at the constant floating level of 25,0
were used for cosmic radiation researches, within the organization of the European Co
for Nuclear Research. Moreover, the data of 230 other radio soundings, carried out d
the same season at the Elmas Base, were also utilized. The wind direction frequency
centage in the sixteen main directions was thus computed, for given speed ranges, at 500
100 & 50 mb. The mean wind speeds at the same levels were also computed. A preva
westerly stream up to 200 mb was thus pointed out; furthermore, at higher levels, a st
increase of the frequency of east component winds, definitely prevailing from the 50 mb
upwards, was verified. In the comparison of mean wind course versus altitude, a stre
maximum a little below the tropopause level, and a noticeable speed decrease in the l
layers of the stratosphere to a zero value at the level of wind direction reversal were n
Above this level the wind speed again increased with the altitude. The Mediterra
branch of the jet stream was also brought into evidence, by means of meridional cross-sect
near the Elmas meridian. *Subject Headings:* **1. Upper air observations 2. Cosmic ray so
ings 3. Upper air winds 4. Mediterranean area.**—*Author's abstract.*

## INSTRUMENT CARRIERS

*See also:* **5-yr. current means** (Barlow), 7.10–39; **5-yr. met. means** (Hay), 7.10–41; **Artificial satellites** (Aujeszky), 7.10–45; **Artificial satellites** (Ovenden), 7.10–46; **M.O.U.S.E.** (Porter), 7.10–47; **Rocket method for determining upper atmos. properties** (Groves), 7.10–126.

7.10–77 551

Mastenbrook, H. J. and Anderson, A. D., **Proposed trans-oceanic system for collec
surface meteorological data.** *U. S. Naval Research Laboratory, NRL Memorandum Re*

36, Nov. 1955. 9 p. 4 figs., 6 refs. **DWB**—An instrumented buoy, designed to collect transmit data, and which can be positioned over distances of several thousand miles high-frequency direction-finding techniques, is proposed as a means of collecting meogical data on a trans-oceanic scale. It is concluded, on the basis of technical and rological considerations, that a long range weather buoy is feasible. Ships and ocean ats offer a means of delivery to regions of meteorological interest. An experimental am, including field evaluation, is recommended to further define the feasibility in terms e effectiveness of buoy transmissions for positioning and data collection, component ility, and drift trajectories. *Subject Headings:* **1. Automatic weather stations 2. Buoy er stations.**—*Authors' abstract.*

7.10–78 551.507.1

Blanthorn, Boyd L. and Thompson, Harold V., **Mobile meteorological recording van.** *Dugway Proving Ground. Technical Services Division, Developmental Report,* No. 13, 5?] 47 p. figs. (incl. photos). **DWB**—The Mobile Meteorological Van designed for recording wind direction, wind speed, and temperature at one or more points in a testing is described in detail and equipment, circuits, etc. are illustrated. The van is wired for a in connection from the junction box so the one set of instruments can serve for any one veral grids. A second type is described in the appendix, consisting of a permanent meogical recording station or cubicle, and a mobile recording trailer. The fixed station used in a 13½′ by 12′ by 9′ house and the trailer in a 24′ house trailer as illustrated. This ment is now being tested at Dugway Proving Grounds. *Subject Headings:* **1. Mobile her stations 2. Wind and temperature recording grids 3. Micrometeorological recording ment 4. Dugway Proving Ground, Utah.**—*M.R.*

7.10–79 551.507.321.2:621.396.9

Anderson, Albert D., **Estimate of the tracking effectiveness of high frequency radio tion finding for transosonde balloons.** *U. S. Naval Research Laboratory, NRL Memdum Report,* 502, Sept. 1955. 9 p. 20 figs., table, 4 refs., 3 eqs. **DWB**—Data obtained he U. S. Federal Communications Commission during transosonde flights made in the g of 1953 from Minneapolis, are analyzed to show which frequencies would obtain best ts and how good those results would be in terms of the number of fixes possible from an rary network of tracking stations. It was found that 50 watts would supply enough r, and that two frequencies at 6420 and 12,855 Kc would suffice for most propagation itions up to 3000 mi range. The mid-ocean areas (N. Atlantic and N. Pacific) would be covered by the proposed network and frequencies. Charts of Atlantic, Pacific and U. S. details of network, flights made in 1953, areas covered by different stations at 3 frecies and different ranges (2000, 3000 and 4000 mi) and graphs show % of fixes received istances up to 6000 mi at the 3 frequencies. *Subject Headings:* **1. Transosonde tracking orks 2. Minneapolis, Minn. I. U. S. Federal Communications Commission.**—*M.R.*

7.10–80 551.507.3:551.501.7:551.557

Anderson, Albert D.; Mastenbrook, Henry J. and Cubbage, Henry D. (*all, Naval Res.* ), **The transosonde: a new meteorological data-gathering system.** *U. S. Naval Research oratory, NRL Report,* No. 4649, Nov. 3, 1955. 18 p. 7 figs., 13 refs. **DWB**—A new cept of upper air data collection has evolved from the consideration of the use of controlled-ude balloons by the Japanese during World War II. This concept is one of meteorological collection from instrumented balloons controlled to float at a given constant-pressure face in the atmosphere. The system implementing this concept, the U. S. Navy transole (trans-oceanic-sonde), has had its balloons tracked over distances of thousands of miles means of a network of shore-based high-frequency radio direction-finder stations. Field s have established the technical and meteorological feasibility of this system. The most able form of data has been provided by placing primary emphasis on the trajectory of balloon. *Subject Headings:* **1. Transosondes 2. Constant level balloons 3. Upper air ervation.**—*Authors' abstract.*

7.10–81 551.507.362:551.506.7

*†Newell, Homer E., Jr. (*U. S. Naval Research Lab., Wash., D. C.*), **Rocket data ... mospheric pressure, temperature, density, and winds.** *Annales de Géophysique*, 11(2):115–144, April/June **1955.** 25 figs., 4 tables, 41 refs., 5 eqs. **DLC**—A compreh... review of all of the important results obtained by rocket observations of pressure, de... temperature and wind since 1945 at White Sands and other places by the U. S. Navy ... Corps and Air Force. Rockets are illustrated and curves presented showing latest esti... of structure of these elements to 220 km in some cases. Data over the equator and a... latitudes are compared with those over New Mexico. Discussion includes: Heating by ... measurement of pressure by X-rays, rocket grenade experiments (sound speed), the f... sphere experiment, the shock wave angle experiment; and U.S.A.F.—University of Mic... data obtained from impact pressure at the nose of an aerobee. Not enough data exi... settle problems of diurnal vs seasonal and geographic variations. *Subject Headings:* **1. R... data 2. Upper air data 3. White Sands, N. Mex.**—*M.R.*

## INSTRUMENTS

*See also:* **Met. influence on industrial waste gases** (Löbner), 7.10–122; **Daily temp. conditions in stratosphere** (Veikko), 7.10–188; **Approach visibility studies** (U. S. W. B.), 7.10–280; **Skylight polarization** (Calif. Univ. Dept. Met.), 7.10–288.

7.10–82 551.508:551.586:...

Aschoff, Jürgen and Wever, Rütger, **Fortlaufende Bestimmung des Wärmestroms... der Wärmedurchgangszahl am Menschen mit einfacher Methode.** [Continuous deter... tion of the heat current and heat transmission index in men by a simple method.] *N... wissenschaften*, Berlin, 43(11):261–262, June 1, **1956.** fig., 6 refs., 2 eqs. **DWB**—In l... organisms heat is mainly transported convectively by the blood stream. In men the "... transmission index" (heat transfer in cal/cm²/min for 1°C effective temperature differ... is a measure of the blood circulation. The continuous electrical measurement of the ... current and of the index is described with an example for the hand and fingers. The rel... of the index to A. C. Burton's "thermal circulation index" is discussed. *Subject Headi...* **1. Bioclimatic research 2. Heat transmission index.**—*C.E.P.B.*

7.10–83 551.50...

Georgi, J., **Meteorologischer Universal-Strahlungsmesser mit Solarimetersäule M... Gorczyński.** [Meteorological universal radiation meter with the Moll-Gorczyński solarim... pile.] *Meteorologische Rundschau*, Berlin, 9(5/6):89–92, May/June **1956.** 4 figs., 9 ... **DLC**—A cheaper form of the Moll-Gorczyński solarimeter is described and illustrated. ... can be used as an actinometer with various filters, pyranometer for global, sky, sun or ... radiation or albedo, or effective pyranometer for upper or lower hemisphere, ultraviolet ra... tion, radiation balance or ground radiation. *Subject Heading:* **1. Solarimeters.**—*C.E.P.B.*

7.10–84 551.50...

Khakhalin, V. S., **Uluchshenie otschetov obychnogo aspiratsionnogo psikhromet... pomoshch'iu tsilindricheskikh linz.** [Improvement of readings from ordinary aspira... psychrometer by the use of cylindrical lenses.] *Meteorologiia i Gidrologiia*, Leningrad, ... 4:48, July/Aug. **1955.** fig. **DWB**—In order to eliminate errors in reading the opera... psychrometer caused by the breathing of the observer there has been developed a devic... reading both thermometers at a distance of one meter or more. It consists of two sim... cylindrical lenses connected by the ends of metallic clamps and attached to the psychrom... with special laths. The construction of this device is described and it is illustrated by m... of a photograph. *Subject Headings:* **1. Aspiration psychrometers 2. Psychrometer readin...** *I.L.D.*

7.10–85 551.50...

Berry, Dick and Berg, Alan B., **Inexpensive rain gauge.** *Oregon. State Board of Fore... Research Note*, No. 23, March **1955.** 4 p. 4 photos., ref. **DWB**—No. 10 canning cans ...

.meter and 7″ deep) can be obtained new for 10¢ per can if purchased in lots of 1000; cans are even cheaper. Aluminum foil costs $3.85 for a 24″ roll 100 ft long which can be into 240 funnels or <2¢ per funnel. The graduated cylinder is made of lucite and is all, 2″ in outside diameter with a .125″ sidewall and costs $2.20 per foot. The cylinder duated empirically by pouring in one inch of water (from the can), marking, and dividing pace into 100 equal parts. These gages were used in forests of Oregon by Oregon State l of Forestry, instead of U. S. Weather Bureau or Forest Service gages that cost several s per can. All details of construction are described and illustrated. The gages can be loned at end of season. *Subject Headings:* **1. Simplified rain gages 2. Rain gage con-tion 3. Oregon.**—*M.R.*

7.10–86 551.508.77

Huff, F. A., **Comparison between standard and small orifice raingages.** *American hysical Union, Transactions*, 36(4):689–694, Aug. **1955.** 7 figs., 3 tables, 5 refs. Shorter on in *Weatherwise*, 9(3):94–96, June **1956.** 7 figs., table. **DWB**—Careful comparisons made during March–Nov., 1953–1954 between 6 standard 8-in. (U. S. W. B.) rain gages types of small orifice rain gages in common use in the U. S. Of these, the wedge-shaped 3-in. gages gave the best correlation with the 8-in gages, and the 1.15-in. and 0.8-in. gage tly poorer results. The latter gave consistently higher readings than the 8-in. gages. ations are shown for each comparison and between the 3 pairs of 8-in. gages. These ed the best relation. Comparisons were made for different storm sizes, different wind is and variation with distance (greater than difference between types of gages). All s except the 3-in. gage were mounted at same level at the Univ. of Illinois Airport on low land. *Subject Headings:* **1. Rain gage comparisons 2. Small orifice rain gages.** *.R.*

7.10–87 551.508.77:551.556

Kurtyka, John C., **Discussion of "Precipitation measurements on windswept slopes" ustin E. Helmers.** *American Geophysical Union, Transactions* 36(3):493–494, June **1955.** B—A comparison is made between horizontal, tilted and stereo gages as to their effective- in catching rain when strong upslope or downslope winds occur. In the former case the ontal gage is ineffective; in the latter case the tilted gage is ineffective since the wind s parallel to the orifice. A stereo gage with tilted shield would be equivalent to a tilted multiplied by the secant of the angle of slope. *Subject Headings:* **1. Tilted rain gages ereo rain gages 3. Wind effects on precipitation measurement 4. Rain gage effectiveness.** *.R.*

7.10–88 551.508.822

Beelitz, P., **Die sowjetische Wolna-Radiosonde.** [The Soviet Volna radiosonde.] *Die nik*, Berlin, 10(1):43–44, Jan. **1955.** 3 figs., 3 refs. **DLC**—The year 1930 is considered "birth year" of the radiosonde, as Molchanov (Jan. 30), Bureau (May 8), and Duckert y 22) first succeeded in making soundings by that method. The Molchanov instrument used in U.S.S.R. until the end of the war when the completely automatic recording radio- le Volna (wave) was developed in Sverdlovsk by Ing. A. M. Kassatkin. The frequency 8–12.9 m) is modulated by capacitance changes, in a manner similar to that of the Finnish osonde. Accuracy is ±0.5°C for temperature, ±5% R.H. and ±2.5 mb pressure. It hs 800 g. Bimetallic temperature element, hair hygrometer, and pressure capsules operate ically 3 times a minute (300–360 m/min ascension rate) making 3 curves on record paper. er details are shown in photo and drawings. *Subject Headings:* **1. Volna radiosonde adiosondes.**—*M.R.*

7.10–89 551.508.91

Dodd, C., **Particle detection by bubble chambers.** *Science Progress*, London, 44(175): –414, July **1956.** 2 figs., plate, 10 refs. **DWB**—The disadvantages of the cloud chamber photographic emulsion detector are removed in D. A. Glaser's bubble chamber (1952) which an ionizing particle forms bubbles in superheated liquid. The theory is discussed,

types of chamber and liquid media for different purposes are described. The possibi using a bubble chamber for cosmic rays is considered. *Subject Heading:* **1. Bubble cha** —*C.E.P.B.*

7.10–90 551.508.91:551

Ohta, S. (*Central Met. Obs. Tokyo Japan*) **On the efficiency of the Aitken nuclei co** *American Meteorological Society, Bulletin*, 36(9):456–458, Nov. **1955.** 3 figs., 2 refs. **DWB, DLC**—Recently a paper (Hosler C. L. et al) was published **"On the effect o lapse between the processes of sampling and expansion in the Aitken nuclei counter"** 33(6):251–254, **1952;** *see* 5.9-218, Sept. 1954, *MAB*). The conclusion was that a rapid of nuclei occurs in the counter. The cause of this decay was attributed to the gravita effect upon the nuclei in the counter. Another effect, however, a diffusion of nucle noticed by the present writer, and by this effect the decay of small nuclei was well expl *Subject Headings:* **1. Aitken counter 2. Nuclei decay. I. Hosler, C. L.**—*Author's abstr*

7.10–91 551.5

Pollak, L. W. and O'Connor, T. C. (*Dublin Inst. for Advanced Studies*), **A photoel condensation nucleus counter of high precision.** *Geofisica Pura e Applicata*, Milan, 32 146, Sept./Dec. **1955.** 4 figs., 2 tables, 6 refs. German summary p. 139. **DWB, D** A new model of the direct beam photoelectric condensation nucleus counter and its prop are described. The main feature of the construction is the reduction of the fog-tube dia which resulted in the complete elimination of all uncertainties in the measurement of the intensity after the fog is formed by adiabatic expansion. *Individual* measurements with identical counters of this design which incorporate all previous improvements, agree to than 5% in 70% of all cases, their average absolute difference being 2%. Deviations of than one division of meter readings (or 10% of concentration) were not observed. agreement is maintained over long periods. A calibration curve of the latest model o photoelectric nucleus counter is given. *Subject Heading:* **1. Photoelectric nuclei cou** —*Authors' abstract.*

7.10–92 551.5

Rau, W., **Eine vereinfachte Ausführungsweise der VITTORI-Methode zum Nach von Chloridteilchen im Aerosol und die Bestimmung der Teilchengrösse.** [A simp method of applying the Vittori method to demonstrating chloride particles in aerosol an determination of the particle size.] *Archiv für Meteorologie, Geophysik und Bioklimato Ser. A*, Vienna, 9(2):224–231, **1956.** 6 figs., 5 refs. German, English and French summ p. 224. **DWB**—The relation between the size of chloride-particles and the size of the L gang-rings, produced by them in gelatine layers, containing $AgNO_3$, is measured by sedim tion. A simplified mode of this indication method, especially suitable for long time rec is developed, and the effectiveness of the electric aerosol separator used in our experim is proved. *Subject Heading:* **1. Saline nuclei determination.**—*Author's abstract.*

7.10–93 551.508.91:551.5

Verzár, F. (*Univ. of Basel, Switzerland*), **Continuous record of atmospheric condens nuclei and of their retention in the respiratory tract.** *Geofisica Pura e Applicata*, M 31:183–190, May/August **1955.** 5 figs. (incl. photos), 18 refs. German summary, p. **DWB, DLC**—Description of an "automatic condensation nucleus counter" and record tained. Records are made every 15 min extending over a period up to a full year and at different locations in Switzerland. The retention of atmospheric condensation nuclei normal room air and cigarette smoke was investigated on dogs. The trachea retained 60 of nuclei from room air and 71.1% from room air contaminated by cigarette smoke; the 73.6% from room air and 78.6% from room air with cigarette smoke. In humans the reten amounted to 70.1% of condensation nuclei from air containing cigarette smoke. An exte communication will be published in "Pflüger's Archiv." *Subject Headings:* **1. Verzár ph electric nuclei counter 2. Automatic nuclei recorders 3. Respiratory system retentio nuclei.**—*Author's abstract.*

# SYNOPTIC ANALYSIS AND FORECASTING

*ee also:* **Synoptic atlas** (Pogosian), 7.10-16; **Marine forecasting** (Parczewski), 7.10-43; **Meteorology and hay fever** (Dingle), 7.10-118; **Weather processes in troposphere and their prediction** (Dahler), 7.10-141; **Deficiencies in geostrophic approximation** (Hollmann), 7.10-198; **Prediction of extreme turbulence** (Bates), 7.10-199; **High humidities and temp.** (Dodd), 7.10-214; **Cloudiness in S. conditions, Canterbury** (Latimer), 7.10-228; **Weather** (Bowen), 7.10-233; **Feb. 1955 floods, New South Wales** (Bond, Wiesner), 7.10-237; **Measurement errors in runoff forecasts** (Dean et al.), 7.10-251; **Flood forecasting** (Kresge, Nordenson), 7.10-254.

7.10-94 551.509(09)

Royal Meteorological Society, Canadian Branch, **Forecasting in Canada: past, present future. A panel discussion.** D. P. McIntyre, moderator. Its [*Publication*], 5(3), . 17 p. Contents: McLeod, K. T., **Historical development.** Godson, W. L., **Numerical asting.** Muller, B., **Forecasting by statistical methods.** Boville, B. W., **Forecasting ssembly-line procedures. DWB**—In the chapter **Historical development**, the author nes developments in meteorology that furthered the advance of weather forecasting since ERRIER and describes the forecasting methods used in Canada. **Numerical forecasting** liscussion of the characteristics of the general circulation that lend themselves to numerical asting and possible future developments in numerical forecasting. B. MULLER describes tail ELIAS GRYTØYR's (*Geofysiske Publikasjoner*, 17(9) **1950**; *see* 2.5-40, May 1951, *MAB*) e Diagram Method" which aims at synthesizing the weather from daily synoptic charts. **casting by assembly-line processes** is a discussion of the requirements for standardizing, ematizing and speeding up weather forecasting by adopting assembly-line techniques. ll stenographic report of the discussions of these papers is included. *Subject Headings:* **Weather forecasting 2. History of weather forecasting 3. Numerical forecasting anada. I. McLeod, K. T. II. Godson, W. L. III. Muller, B. IV. Boville, B. W.**—*I.L.D.*

7.10-95 551.509.1(26):621.396

**Weltübersichtskarte der Küstenfunkstellen welche Wettermeldungen entgegennehmen.** orld chart of coast radio stations which take part in weather warnings.] *Wetterlotse*, No. 5:68-69, March **1955.** fold. chart. **DLC**—The folding chart gives the positions of all ions and weather ships which issue warnings (except in N.W. Europe, where only the man system is given, and U.S.S.R., for which no information is available). *Subject Head-* **1. Marine broadcasts.**—*C.E.P.B.*

7.10-96 551.509.2:621.397

Roediger, Geert, **Erfahrungen im Fernsehdienst.** [Experiences in television service.] *many. Deutscher Wetterdienst, Mitteilungen*, No. 10:70-71, Feb. **1955. DWB**—Some s for conducting television discussions of the weather situation and forecasts for the public introduced on the basis of experience at the Hamburg meteorological station which started broadcasts in the spring of 1951. They deal with the manner of drawing weather maps blackboards during the broadcast (perhaps previously drawn with faint lines); the spacing of bars, the moderate use of temperature and other values, avoidance of technical terms, the ting of such pressure structures only which may influence the weather being forecast and importance of keeping a close contact with the public. The author also discusses the daily edule which is not limited to northwest Germany and Berlin, but has been expanded since v. 1954 and now includes southern Germany. *Subject Heading:* **1. Television weather adcasts.**—*A.M.P.*

7.10-97 551.509.311:551.515

Gião, Antonio, **Sur la prévision des perturbations atmosphériques.** [Forecasting of nospheric disturbances.] *Geofisica Pura e Applicata*, Milan, 32:124-130, Sept./Dec. **1955.** efs., 15 eqs. English summary p. 124. **DWB, DLC**—The paper begins with an analysis the relations existing between the notions of analyticity, nonanalyticity and unicity of the utions of equations of evolution of a certain type and the notions of determinism, indeter- nism and predeterminability of the corresponding phenomena. These results are then

applied to the atmospheric perturbations and it is shown, by means of the distribution th that the solutions of a spatio-temporal differential equation of these perturbations, previ deduced by the author in other papers, have the unicity property. This is the theor proof that such an equation can be applied in weather forecasting. Finally, a new proc is outlined for an easy determination of the nonanalyticity factor appearing in the ge solution of the perturbation equation. *Subject Headings:* **1. Weather forecasting 2. turbation equations 3. Atmospheric disturbances.**—*Author's abstract.*

7.10–98 551.50

Bergthórsson, Páll (*Icelandic Weather Service, Reykjavik*) and Döös, Bo R. (*Un Stockholm*), **Numerical weather map analysis.** *Tellus*, Stockholm, 7(3):329–340, Aug. 9 figs., 3 tables, 5 refs., 15 eqs. **DLC**—A method to analyze upper air charts numerica presented. The analysis is expressed by the height values of the pressure surface in points. The computed height in a gridpoint is obtained as a weighted mean of height v derived from the surrounding height and wind observations, the forecast height in the and the corresponding normal height. Nine 500 mb maps are analyzed with the aid o Swedish computor BESK, six of these consecutive. The size of the grid was 32×41 pc The analyses have been compared with two independent conventional analyses. The r values of the root mean square of the differences between the numerical and the convent analyses were 26 m and 24 m respectively and 26 m between the two conventional ones. root mean square of the differences between the observed and analyzed heights was 22 m ir mean. This is roughly what should be expected judging from the existing knowledge a observation errors. Three barotropic forecasts have been computed from the nume analyses. They are compared with the corresponding numerical forecasts from convention analyzed maps. It was not possible to find any significant difference between the good of the forecasts based on the numerical analyses and the conventional analyses. *Su Heading:* **1. Numerical forecasting techniques.**—*Authors' abstract.*

7.10–99 551.509

§Bushby, F. H. and Huckle, Vera M., **The use of a stream function in the Sawyer-Bus two parameter model of the atmosphere.** *Great Britain. Meteorological Research Comm M.R.P.* 956, Jan. 23, **1956.** 5 p. 4 figs., 4 refs., 6 eqs. Mimeo. **DWB**—"Describes attempt to improve upon the geostrophic approximation by representing the wind field in isobaric surface by a stream function which differs from the geopotential." Of three 2 forecasts (made with an electronic computer), 2 improved on forecasts computed without stream function. *Subject Heading:* **1. Numerical forecasting techniques.**—*C.E.P.B.*

7.10–100 551.509.312:517.5

Gambo, K.; Katow, K.; Manabe, S. and Aihara, M. (*all, Geophysical Inst., Tokyo Un*) **Numerical forecasting over the Far East by the double Fourier series method.** *Meteorolog Society of Japan, Journal, Ser. 2*, 33(3):133–139, July **1955.** 6 figs., 2 tables, 5 refs., 29 **DWB, DLC**—The results of numerical forecasting over the Far East are presented. In paper, we use the double Fourier series in order to calculate the Jacobian of vorticity $\zeta$ the height of isobaric surface $Z$ and also to solve the Poisson equation. We also show that results of numerical forecasting will be improved if we take a shorter time interval betw each step. In connection with this problem, the outline of the relay-computer (FACOM-1 which is available is described briefly. *Subject Headings:* **1. Numerical forecasting 2. Dou Fourier series 3. Far East.**—*Authors' abstract.*

7.10–101 551.509.

Hacque, S. M. A. (*Math. Dept., Dacca Univ.*), **Principles of numerical weather forecasti** *Pakistan Journal of Science*, Lahore, 7(1):41–46, Jan. **1955.** 10 refs., 18 eqs. **DWB**—T defects of the traditional methods of extrapolation, the complex nature of atmospheric process the nature of the filtering approximations in the equations, the application of numerical meth to weather forecasting and the unstable nature of the atmosphere and the ultimate limitati of weather forecasting are discussed. *Subject Headings:* **1. Numerical forecasting 2. Ext polation.**—*Author's abstract.*

7.10–102 551.509.312:551.509.317

Jordan, Charles L., **An experiment in low-latitude numerical prediction with the baro-c model.** *Journal of Meteorology*, 13(3):223–235, June 1956. 17 figs., 4 tables, 16 refs. 3—Twenty 24 hr forecasts for spring and summer were based on a simple model assuming ervation of vertical component of absolute vorticity of individual fluid elements and the trophic approximation. Computation extended from S.E. Canada well into the Caribbean 361 grid points. Checks of twelve 500 mb forecasts by correlation gave 8 values for the ral area above 0.75 and 5 above 0.9. The space distribution of the coefficients and the rences between forecast and observed values are plotted; the forecast changes were gen-y too high. Coefficients for the 200 mb level were generally lower. The 500 mb forecasts the large-scale flow patterns and large height changes with fair success as far south as N, but deep troughs in the westerlies were moved too rapidly and strong ridges too slowly. *ject Headings:* **1. Numerical forecasting 2. Barotropic models.**—*C.E.P.B.*

7.10–103 551.509.312:551.513.2:551.515

Manabe, S. (*Geophysical Inst., Tokyo Univ.*), **On the development and the energetics he westerly waves. (Model research on the tilt of trough).** *Meteorological Society of an, Journal, Ser. 2*, 33(2):76–88, March **1955.** 8 figs., 7 refs., 7 eqs. **DWB, DLC**—Using yer model which is the special case of the multiple layer model defined by CHARNEY and LLIPS, investigation is made, from the view point of numerical weather prediction, on the of the tilt of trough relative to the vertical for the development of the pressure pattern. he same time, the mechanism of the transition between the tilted and the nontilted trough iscussed. Finally, corresponding to the above development, the energetics of westerly e, i.e., the energy exchange between the potential and the kinetic energy is investigated. e, the simple expression for the change of these energies is obtained. *Subject Headings:* **Numerical forecasting 2. Upper level troughs 3. Waves in the westerlies.**—*Author's ract.*

7.10–104 551.509.312:551.509.317

Palmierei, Sabino, **Il metodo di Fjörtoft per la preparazione delle topografie previste 500 mb.** [The Fjörtoft method for the construction of prebaratic 500 mb contour charts.] *ista di Meteorologia*, Rome, 15(2):13–31, April/June **1955.** 11 figs., table, 6 refs., 18 eqs. lian, French, German and English summaries p. 13. **DLC**—Brief report on theoretical es and practical application of the FJØRTOFT method for preparing 500 mb forecast charts. e writer takes the opportunity to present an application of the above method, covering a ll of 24 hrs, during which an intense evolution was taking place in the gulf of Genoa (Feb. 20, 1955). *Subject Headings:* **1. Prebaratic charts 2. Fjørtoft's graphical method.**—*thor's abstract.*

7.10–105 551.509.312

*Rosini, Ezio, **Sulle tendenze barometriche in Italia.** [Pressure tendencies in Italy.] *ivista di Meteorologia Aeronautica*, Rome, 15(1):43–48, Jan./March, **1955.** 6 figs. French, glish and German summaries p. 43. **DLC.** (Also in: Italy. Servizio Meteorologico dell'-ronautica, **Il Servizio Meteorologico dell'Aeronautica Italiana alla X Assemblea Generale G.G.I.** Rome, **1954.** p. 65–70. 6 figs. English summary p. 65.) **DWB**—The problem a statistical analysis of pressure tendencies in Italy is discussed. Preliminary considerations ow that the use of "mean values" is inadequate. Hence the introduction of other statistical dexes appears necessary. Pressure tendency data for the five-year period 1949–1953 (Hours: , 07, 13, 19 EMT) of all first-class stations of the Italian Meteorological Network were alyzed. The data were grouped in quintiles and are presented here, together with median lues, for all climatic regions. A general outline is given of the monthly tendency pattern. his analysis, the first of its kind in Italy, has been made possible through the use of the Punched Card Machine Pool" recently established by the Italian Weather Service. *Subject eadings:* **1. Barometric tendency calculations 2. Punched card applications 3. Italy.** – *uthor's abstract.*

7.10–106 551.509

**Progress in numerical weather prediction.** *Meteorological Magazine*, London, 85(10 176–179, June **1956. DWB**—E. KNIGHTING, opening the discussion on March 19, 1 described the experiment at Washington by the Joint Numerical Weather Prediction U An iteration method with ½ hr steps gave "baroclinic" forecasts for 12, 24 and 36 hrs, "barotropic" forecasts, using a much larger area, for 24, 48 and 72 hrs. The synoptic forec were as good as those made by orthodox methods. F. H. BUSHBY and others comp British work and mentioned a number of difficulties. *Subject Headings:* **1. Numerical f casting techniques. I. Knighting, E. II. U. S. Joint Numerical Weather Prediction U** —*C.E.P.B.*

7.10–107 551.509.33:551.524.37:551.59

Faust, H., **Über den kalten Februar 1956.** [Cold February 1956.] *Naturwissensch liche Rundschau*, Stuttgart, 9(5):199–200, May **1956. DWB**—Long range forecasters Germany predicted a mild winter in 1955/56, but in Feb. weather turned very cold. was due to a change from zonal to meridional circulation, which according to F. BAUR follo a decrease of sunspot number from 156 on Nov. 11 to 32 on Jan. 10. This probably cause decrease of ultraviolet radiation and a fall of temperature in the ozone layer. *Subject Headi* **1. Severe winters 2. Long range forecasting 3. Solar influences 4. Germany.**—*C.E.P.*

7.10–108 551.509.39:551.578.41

Brooks, Charles F., **Forecasting from snow crystals.** *Mt. Washington Observat Gorham, N. H., Bulletin*, No. 28:9–10, Dec. **1955.** 2 refs. (in text). **DWB**—A project u under way at Mt. Washington Observatory (since May 1955) entails microphotograph snow crystals at intervals of 10 minutes during every snowfall, or oftener, if changes of inten of snowfall or type of crystal occur. All surface and upper air data is coordinated with snow crystal data in order to determine the relationship between snow crystal type and weat processes for use in forecasting weather. Enlargement by microscope is 10 to 300 times, w 10 power used most often. Temperature in clouds can be estimated from crystal type. *Su ject Headings:* **1. Snow crystal photography 2. Forecasting from snow crystals 3. Indir aerology 4. Mt. Washington, N. H. I. Weickmann, H.**—*M.R.*

7.10–109 551.509.5:551.

Johnson, D. H., **The success achieved in forecasting upper winds by orthodox and s tistical techniques.** *Great Britain. Meteorological Research Committee, M.R.P.* 953, Dec. **1955.** 27 p. 4 figs., 14 tables, 10 refs., eqs. Also: Durst, C. S., **Comments on statistical a orthodox forecasting.** *Ibid.*, p. 955, Jan. 9, **1956.** 3 p. 5 tables, ref. Mimeo. **DWB** JOHNSON compares 24 hr forecasts of 700–100 mb winds over 4 months by 3 orthodox metho DURST's regression equations and persistence, with the actual winds at Liverpool, O.W.S. and route Shannon-Gander. The root-mean-square errors of each type are broken down in bias and standard deviation, and frequency distributions are tabulated. The statisti forecasts were less accurate than the Central Forecasting Office and London Airport foreca up to 200 mb, but better than the use of persistence alone. At 100 mb there was little diff ence. DURST comments on the paper and gives r.m.s. errors for 500 mb forecasts for Atlan and European routes. He concludes that the improvement of orthodox over statistical fo casts is not great, and for winds at high levels is discounted by the greater speed of preparat of the latter. *Subject Headings:* **1. Forecast accuracy 2. Statistical forecasting 3. Upp air wind forecasts.**—*C.E.P.B.*

7.10–110 551.509.5:629.

Rodewald, M., **Schadensmeldungen als Hinweis auf meteorologische Gefahrengebie** [Damage warnings as evidence of meteorological danger regions.] *Wetterlotse*, Hambu No. 99:57 66, April **1956. DLC**—A list of warnings in Dec. 1955–Feb. 1956, extracted fr **Lloyd's List and Shipping Gazette.** Includes: tropical cyclones, E. coast of Madagasc blizzard in N. Japan; storm on Japanese E. coast; typhoon RUTH; squall near Celeb damaging gusts in Arabian harbors; cyclone in N. Ceylon; bora storm in Trieste; cold storm from S.E. in North Sea; hurricane in Fiji Islands; boreas in Bosphorus and Cana Island storm. To be continued. *Subject Heading:* **1. Shipping warnings.**—*C.E.P.B.*

# ARTIFICIAL PRECIPITATION

*See also:* **Buoyancy and precip. in tropical clouds** (Ackerman), 7.10–227.

7.10–111 551.509.67

Neuwirth, R., **Künstlicher Regen? Entwicklung und Probleme der experimentellen ederschlagsbeeinflussung.** [Artificial rain? Development and problems of experimental nfall modification.] *Umschau*, Frankfurt a.M., 56(9):257–259, May 1, **1956.** fig., refs. **DLC**—The investigation of physics of cloud and precipitation which began in 1938 h W. Findeisen is described. Radar showed that in temperate latitudes heavy rain stly passed through an ice phase. Numerous researches showed the importance of con- nsation nuclei. Extensive experiments in U. S. on inoculation with dry ice or especially er iodide showed a probable but not certain positive effect. Overseeding has been used to perse thunder clouds. *Subject Heading:* **1. Cloud seeding.**—*C.E.P.B.*

7.10–112 551.509.67

**Rain-making in Tanganyika.** *Nature*, London, 177(4522):1204, June 30, **1956. DWB**—te of a statement by Lennox-Boyd in Parliament of cloud-seeding by 2″ rockets incor- rating particles of sea salt, bursting at 3000 ft. Rain repeatedly occurred 12 min after ding. In April the seeded area had 1–1½″ more than neighboring regions. *Subject Head- s:* **1. Cloud seeding with salt 2. Tanganyika.**—*C.E.P.B.*

7.10–113 551.509.67

Roy, A. K., **Rain-making: its present position and future possibilities.** New Delhi, uncil of Scientific and Industrial Research, **1955.** 31 p. 9 figs. (incl. photos) 60 refs.— objective report and evaluation of progress in artificial control of clouds and precipitation ring the past decade and of knowledge of cloud physics gained during the past two decades various countries. The report discusses: rain formation in clouds, rain making in super- oled clouds, in warm clouds, need for rigorous tests of results of experiments, and limitations known techniques. Diagrams show in great detail structure of natural rain cloud, of warm ud with precipitation induced by injecting water or salt in base of cold cloud in the Ganges a where seeding would be successful, and unsuccessful, respectively, and an intermediate e (weak updraft but plenty of moisture) where precipitation would fall but be incon- uential. *Subject Headings:* **1. Artificial precipitation reports 2. Cloud seeding in India. Ramanathan, K. R.**—*M.R.*

7.10–114 551.509.67

Terada, Kazuhiko and Sakanoue, Tsutomu, **On the artificial stimulation of rain in the ūsyū area, Pt. 2.** *Oceanography and Meteorology*, Nagasaki, 6(2/4):147–202, Dec. **1954.** figs., 6 tables, 17 photos., 18 refs. In Japanese; English summary p. 203–206. **DWB**—is report contains a detailed discussion of cloud seeding experiments conducted in the usyu area in Dec. 1952. In addition to a description of the technique used (balloon-borne paratus for AgI and dry-ice seeding), the report contains an account of each seeding operation ec. 8, 14, 15, 24 and 27), including analyses of the synoptic situations. Results are found couraging but not sufficient for final evaluation. An outdoor experiment is also reported which AgI smoke was found to stimulate the formation of hoar frost. (For Pt. 1, *see* 5.1–100, . 1954, *MAB.*) *Subject Headings:* **1. Cloud seeding 2. Kyūsyū, Japan.**—*G.T.*

# STRUCTURE AND PHYSICS OF THE ATMOSPHERE

## COMPOSITION OF THE ATMOSPHERE

7.10–115 551.510.41:551.510.53:546.17

Sato, Teruo (*Geoph. Inst., Kyoto Univ.*), **On distribution of nitrogen in the upper atmos- ere.** *Journal of Geomagnetism and Geoelectricity*, Kyoto, 5(3):71–82, Nov. **1953.** 3 figs., ables, 17 refs., 53 eqs. **DLC**—In this paper the dissociation of the nitrogen in the upper

atmosphere is studied. It is considered that the nitrogen atom is produced by dissocia recombination of the positive nitrogen ion and the electron, and by the pre-dissociation b absorption in the Lyman-Birge-Hopfield band. The former is effective in the region a about 120 km, while the latter is predominant below that level. The disappearance o nitrogen atom is mainly due to the recombination by two or three body collision. App mately, the former mechanism of disappearance seems to be preponderant over the latt the region where the dissociative recombination is conspicuous. Hence, two pairs of equa in an equilibrium are solved. In the calculations, it is assumed that the temperature is cons throughout the region; the ratio of the concentration of the oxygen atom to that of the of the nitrogen is one-half; and the distribution of total nitrogen follows the law of gas static equilibrium, though the distribution of nitrogen molecule with height is not g previously. The results show that the nitrogen begins to dissociate at the level from 12 to 130 km, and proceeds to completion at about 160 km–220 km. The concentration o nitrogen atom has peak at about 140 km–150 km altitude and its magnitude is of the ord $10^{10}$/cc. *Subject Headings:* **1. Upper atmosphere composition 2. Nitrogen dissociatio** *Author's abstract.*

7.10–116 551.510.41:551

Rossby, C.-G. (*Univ. of Stockholm*) and Egner, H. (*Royal Agri. College, Uppsala, Swe* **Synoptic variations in the chemical composition of atmospheric precipitation.** *Geof Pura e Applicata*, Milan, 31:127–128, May/Aug. **1955.** Summaries only, in German English. **DWB, DLC**—This is a condensation of original article in *Tellus*, 7(1):118– Feb. 1955. (*For abstract, see* 6.10–111, Oct. 1955, *MAB.*) *Subject Headings:* **1. Chem composition of rain 2. Sweden.**

## ATMOSPHERIC POLLUTION

*See also:* **Dust storm** (Astapovich), 7.10–205; **Visibility, Los Angeles** (Neiburger), 7.10–281.

7.10–117 551.510.42:551.510.52/3:551.59

Bigg, E. K., **The detection of atmospheric dust and temperature inversions by twil scattering.** *Journal of Meteorology*, 13(3):262–268, June **1956.** 8 figs., 13 refs. **DW** A photomultiplier recorded ratio of rate of change of twilight illumination to illuminat using red wavelengths at a zenith angle of 70° in the plane of the sun and zenith, in the interior of Australia. A maximum rate of change, indicating top of a haze layer, was fo when earth's shadow passed through 15–20 km, within 3 km of tropopause as shown by ra sondes. A second maximum was in 70–90 km, centered near 80 km. It is shown that the km peak is almost entirely, and the 80 km peak largely, due to dust. The 20 km peak attributed to surface dust and varies inversely with surface pressure (directly with instabili Dust above 40 km (Oct. 20–Nov. 29) coincides with meteor showers and precedes BOWE world rainfall maxima by 30 days. (*See also* 7.5-103, May 1955, *MAB.*) *Subject Headin* **1. Haze layers aloft 2. Twilight discontinuities.**—*C.E.P.B.*

7.10–118 551.510.42:581.86:551.509

†Dingle, A. Nelson (*Ann Arbor, Mich.*), **Meteorologic approach to the hay fever proble** *Journal of Allergy*, St. Louis, 26(4):297–304, July **1955.** 23 refs. **DLC**—Atmospheric c centration of pollen does not depend on any one predictable factor such as temperature, l on the whole complex of "weather." Long range predictions are possible in terms such are used for predicting phenological events (e.g., dates per harvest). Day-to-day foreca are important during the immediate hay-fever season and should be available 36–48 ho before actual counts can be made and publicized. Variable conditions from place to pl and hour to hour make specific local forecasts necessary. Fronts, windy weather and t bulence increase pollen concentration temporarily while rainfall decreases it. The meteo logist with some botanical knowledge can help in obtaining better pollen counts, can anticip degree of severity of season and time of occurrence of severe conditions in any given locali *Subject Headings:* **1. Hay-fever forecasts 2. Pollen pollution predictions.**—*M.R.*

7.10–119 551.510.42:535.37

**Fluorescent powder dispersed into air at central point traces pollution patterns.** *Chemical neering*, N. Y., 92(1):112–114, Jan. 1955. photo. DLC—Fluorescent dust (zinc cadmium ide) in the 1 to 2$\mu$ range, is nonhygroscopic and not affected by sunlight or temperature ges in the atmosphere. The Ralph M. Parsons Co., Los Angeles, has made over 170 (20,000 analyses) to study meteorological conditions for air pollution control in several during 1952 and 1953. Fluorescent dust is safer than radioactive traces, is more easily ured quantitatively than colored smokes, and is not so rapidly diluted over a large area. ves a better indication of point source dispersal than pure instrumental studies of air nts, since the effect of topography, trees, buildings, thermal effects and diffusion are all rated, though valid only for existing or similar meteorological conditions. *Subject ings:* 1. Atmospheric pollution tracing 2. Fluorescent tracers 3. Los Angeles, Calif. rsons, Ralph M.—*M.R.*

7.10–120 551.510.42:551.551:551.510.53

Kellogg, William W., **Diffusion of smoke in the stratosphere.** *Journal of Meteorology*, (:241–250, June 1956. 17 figs., table, 12 refs., 19 eqs. DWB—Smoke puffs (titanium chloride) exploded at given pressures from balloons at heights of 23–63,000 ft were tracked their expansion measured. Puffs were distorted by wind shear and the minimum diameter taken to show rate of eddy diffusion. Growth was regular for first 5–6 min, increasing d in 3 min from an initial diameter of 15–20 m independent of shear, but the rate increased increasing height. Mass growth decreased with increasing stability. The theory of ulent diffusion applied to the growth of a puff gives an equation for visual diameter as a tion of time and some eddy parameters. The root-mean-square eddy velocity increased 4–10 cm sec over the height range studied. *Subject Headings:* 1. Smoke diffusion 2. Turnce in the stratosphere.—*C.E.P.B.*

7.10–121 551.510.42:523.51

Link, F. (*Astrophys. Obs., Ondrejov*), **Poussières météoriques dans l'atmosphère terrestre.** [Meteoric dust in the earth's atmosphere.] *Bulletin of the Astronomical Institutes of Czechoslovakia*, Prague, 4(6):158–161, 1953. fig., 17 refs., 10 eqs. Russian summary p. 161. DLC—ent studies on the rate of supply of meteoric dust in the atmosphere are reviewed. The ply of meteoric dust appears to be of the order of $10^{-14}$ g cm$^{-1}$ sec. as indicated by three rent methods: 1) marine sediments, 2) photometric analysis of zodiacal light, and 3) dust ction at the ground. This order of magnitude is $10^4$ times higher than the figure proposed stronomers on the basis of meteor observations. *Subject Heading:* 1. Meteoric dust. .T.

7.10–122 551.510.42:551.506 551.508.91

Löbner, A., **Meteorologische Einflüsse auf die Ausbreitung industrieller Abgase.** [Meteorological influences upon the spread of industrial waste gases.] *Berlin, Freie Universität, Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 2(4):83–91, 1955. (s., 3 refs. DWB—The problem of atmospheric pollution by industrial smoke and gases investigated. Methods of measurement of degree of pollution and instruments devised the Institute for Water, Soil and Air Hygiene are described and meteorological factors such temperature, humidity, fog, turbulence, wind direction, speed, stratification are discussed correlated with degree of pollution. Studies made by the author in 1935–6 at Berlin are viewed. Effects of forests, parks, gardens, etc. are important in purification of air. Number dust particles correlates highly with relative humidity and inversely with temperature rding to a study made by M. RÖTSCHKE in 1937. The dust filtering or destroying effect hanges in turbulence, as accomplished by means of wide spacing of houses or buildings and nbelts, is emphasized. *See also A-90, Jan. 1956, M.A.B.* *Subject Headings:* 1. Atspheric pollution instruments 2. Meteorological influences on industrial pollution reenbelt effects on pollution 4. Berlin, Germany 5. Collmberg, Germany.—*M.R.*

7.10–123 551.510.42

Newbury, B. C. (*Chem. Dept., Ontario Res. Foundation*), **Meteorology and air pollution.** *al Meteorological Society, Canadian Branch.* [*Publications*], 6(3), May 26, 1955. 6 p.

**DWB**—A descriptive-semipopular account of the meteorological conditions influenci pollution is presented. The relationship of stable and unstable atmospheric conditio air pollution, thermal turbulence and "looping," the role of the thickness of the inv layer in pollution hazard, the origin and dissipation of inversions with special reference t Angeles, method of design of stack heights for minimizing atmospheric pollution and me of assessing turbulence parameters are discussed. *Subject Headings:* **1. Atmospheric poll 2. Atmospheric pollution control.**—*I.L.D.*

7.10–124 551.510.42:551.5

Phillips, B. B.; Allee, P. A.; Pales, J. C. and Woessner, R. H. (*all, U. S. W. B., W D. C.*), **An experimental analysis of the effect of air pollution on the conductivity an balance of the atmosphere.** *Journal of Geophysical Research*, Wash., D. C., 60(3):289 Sept. **1955.** 6 figs., 8 refs. **DLC**—A series of conductivity measurements made in a sealed sphere has shown that in ordinary outside air the suspended nuclei or pollution nor so modify the ionic combination that the electrical conductivities approach equality. conductivities are normally associated with an excess in the density of the small positiv It is found that with decreasing pollution the value of the negative conductivity incr more than does the positive, and the ionic densities approach equality. In clean air, densities of the positive and negative light ions are observed, and the conductivities be proportional to the commonly accepted laboratory values for the ionic mobilities. The re are consistent with recently developed expressions for the diffusion of ions and their at ment to atmospheric particles. *Subject Headings:* **1. Atmospheric pollution effects 2 mospheric conductivity 3. Ion balance.**—*Authors' abstract.*

7.10–125 551.510.42:5

Švestka, Zdeněk (*Astron. Inst. Ondrejov*), **Problem of a meteoritic dust layer in the atmosphere.** *Bulletin of the Astronomical Institutes of Czechoslovakia*, Prague, 5(5):9 **1954.** 2 tables, 32 refs., 37 eqs. Russian summary p. 98. Also English summary as: **Met particles in the atmosphere.** *Nature*, London, 175(4452):377, Feb. 26, **1955. DWB**— paper presents a critical study of LINK's theory of fall and absorption influence of mete particles in the atmosphere. Examining the influence of an atmospheric dust layer o density of the earth shadow and the process of origin of meteoritic dust in the atmosphe come to a conclusion that particles with radii $>1\mu$ resulting from the Link theory cannot source of the absorption observed. Meteoritic dust probably is formed by smaller part of the order of $10^{-5}$–$10^{-6}$ cm. It is shown that a study of sky light polarization might g definite answer to the problem. Study of the process of origin of meteoritic dust also s that particles collected by THOMSEN cannot be of interplanetary nature. *Subject Hea* **1. Meteoritic dust.**—*Author's abstract.*

## UPPER ATMOSPHERE—IONOSPHERE

*See also:* **Recording ionospheric characteristics** (Bibl), 7.10–69; **Nitrogen distribution in upper atmos.** (Sato), 7.10–115; **Atmos. dust and temp. inversions** (Bigg), 7.10–117; **Smoke diffusion in stratosphere** (Kellogg), 7.10–120; **Vertical air movements and tropospheric thermal field** (Pogosian, Burtsev), 7.10–159; **Ionospheric winds** (Berg), 7.10–209.

7.10–126 551.510.53:551.507.362:551.5

Groves, G. V., **Theory of the rocket-grenade method of determining upper-atmosph properties by sound propagation.** *Journal of Atmospheric and Terrestrial Physics*, Lon 8(4/5):189–203, May **1956.** fig., 7 refs., 61 eqs. **DWB**—The method of deducing the f of wind, pressure, density and temperature by explosion of grenades ejected from a ro at roughly equal space intervals, recorded by microphones at the ground (4 is the minim is discussed mathematically. A complete theory is formulated for analyzing the data successive approximation. It is assumed that the Mach number of the wavefront is a kn function of time along any ray, decreasing from about 2 at 100 km to unity with the expan of the wavefront and increasing density. The order of accuracy of pressure determinatio

n is about 3%. *Subject Headings:* **1. Upper atmosphere research 2. Rocket observation iques.**—*C.E.P.B.*

7.10–127 535.215:551.510.53

Mariani, F., **La teoria della fotoionizzazione di Chapman in atmospera non isoterma.** apman's theory of photoionization in nonisothermal atmosphere.] *Annali di Geofisica*, e, 8(1):59–73, Jan. **1955.** 2 figs., 5 refs., 56 eqs. Italian and English summaries p. 73. **BH**—The Chapman (1931) theory of photoionization of the upper atmosphere is reviewed the cases of: a plane atmosphere (radius of earth infinite) and of a spherical (concentric he earth) atmosphere considered for different zenith angles of incident radiation. The perature is assumed to vary linearly with height up to a given altitude and then to become ermal. The two above cases are shown to be almost identical for zenith angles <60°. ation intensity in relation to height of maximum is found to differ somewhat from Chap- theory. *Subject Headings:* **1. Photoionization of upper atmosphere 2. Chapman photo- ation theory.**—*M.R.*

7.10–128 551.501.7:551.510.534

Epstein, Edward S.; Osterberg, Charles and Adel, Arthur, **Note on the variations of ospheric ozone as a function of height.** *Journal of Atmospheric and Terrestrial Physics*, lon, 8(6):347–348, June **1956.** fig., 2 refs. **DWB**—Ozone amounts above Flagstaff, Ariz., -Aug. 1955, measured from the ground by a new method (VODARO) are plotted for height vals 2–11.25–16.25–21.25–27.5–32.5 km and above 32.5. They agree well with results K. Paetzold (*see* 7.2–75, Feb. 1956, *MAB*). *Subject Headings:* **1. Ozone research ertical ozone distribution. I. Paetzold, H.-K.**—*C.E.P.B.*

7.10–129 551.510.534

Paetzold, Hans-Karl (*Max-Planck-Inst. für Physik der Stratosphäre, Weissenau*), **Die kale Verteilung des atmosphärischen Ozons nach Ballonaufstiegen.** [Vertical distribu- of atmospheric ozone according to balloon soundings.] *Zeitschrift für Naturforschung*, *A*, Tübingen, 10(1):33–41, Jan. **1955.** 8 figs., 25 refs. **DLC**—Results obtained during on soundings in recent years at Weissenau, using a UV spectrograph. The marked ations, which are attributed to horizontal and vertical advection, could occur only with cal motions up to 50 km, height of 1 to 10 cm/sec and a reversal of motion at 20 km. In pring a secondary maximum was found at 15 km, caused by advection of polar stratospheric Different types of vertical distribution are illustrated for different seasons. Equatorial e distribution calculation from data obtained during lunar eclipses (1932–1943) is shown hically and discussed. *Subject Headings:* **1. Ozone distribution in upper atmosphere zone advection from Arctic 3. Weissenau, Germany.**—*M.R.*

7.10–130 551.510.535:551.558.29:550.38

Akasofu, Syun-ichi (*Nagasaki Univ.*), **Thermal upward flow in the ionosphere.** *Tôhoku . Science Reports, 5th Ser., Geophysics*, 6(3):150–161, June **1955.** 6 figs., 3 tables, 20 , 35 eqs. **DWB**—It was first shown that the heating of the sun can excite the diurnal ospheric wave, especially the vertical flow, in the F2 region of the ionosphere. Studying drift of ions due to this flow, it was shown that only the drift along the magnetic lines of e is effective. According to the ionospheric data in North America zone, it was found that drift effect is in the order of 150 km at most in height and this corresponds to the velocity ns of about 400~200 cm/sec and to the velocity of thermal flow of about 700~300 cm/sec. *ect Headings:* **1. Geomagnetic effects 2. Diurnal ionospheric waves 3. Ionosphere ical currents.**—*Author's abstract.*

7.10–131 551.557:551.510.535:519.241.1

Barber, N. F., **A correlation treatment of fading signals.** *Journal of Atmospheric and estrial Physics*, London, 8(6):318–330, June **1956.** 10 figs., 2 tables, 2 refs., eqs. **DWB**— theory of the lag correlogram applied to records of spaced receivers is discussed with two nples. A quadrate analysis of the 3 correlations and their 3 rates of change is described

which is generally applicable; other methods of analysis are valid only in special condi
*Subject Headings:* **1. Ionospheric wind measurement 2. Correlation methods.**—*C.E.P.B*

7.10–132 551.510.535:551.594.12:5

Hunaerts, J. and Nicolet, M. (*both, Royal Met. Inst., Uccle, Belgium*), **Interpretati ionospheric results during eclipses.** *Journal of Geophysical Research*, Wash., D. C., 60(4) 538, Dec. **1955.** 6 refs., eqs. **DLC**—Solar emission responsible for E layer ionization ca be represented as coming from a uniform disk, but from one in which the disk is coron nature (elliptic distribution with equatorial brightening and polar darkening, and with of the ionizing radiation outside the visible disk), with a "hot spot" emitting about 7% c total radiation, located at 260° on the limb. Results for Feb. 25 eclipse do not agree Minnis' work on June 30, 1954 (quiet sun) eclipse gives good agreement with above n Latitude variations in temperature gradient must be considered, and a very high recombin coefficient for E layer ($4\times10^{-8}$ $cm^3sec^{-1}$). *Subject Headings:* **1. Ionospheric ionization d eclipse 2. Solar emission models.**—*M.R.*

7.10–133 551.510.535:551.5

King, G. A. M. and Cummack, C. H., **Electron distribution in the ionosphere.** *Jo of Atmospheric and Terrestrial Physics*, London, 8(4/5):270–273, May **1956.** 5 figs. **DWB**—Analysis of *h'f* records at Christchurch, New Zealand, gave contours of ioniz at true heights 100 km upwards throughout the day. Daytime layers form when the strikes tangentially. The E layer is due to a different gaseous component, F1 and F different radiation bands. In the late afternoon the electrons move upward about 10 into a region of lower density. Thermal conductivity is high and temperature unif *Subject Headings:* **1. Ionospheric electron density 2. Christchurch, New Zealand.**—*C.E.*

7.10–134 551.510.535:551.5

Kotadia, K. M., **Sporadic echoes from the E region over Ahmedabad (23°02′N, 72°3** *Journal of Atmospheric and Terrestrial Physics*, London, 8(6):331–337, June **1956.** 9 2 tables, 8 refs. **DWB**—In this paper, a study is made of the sporadic E echoes observe the ionospheric *h'-f* records of Ahmedabad ($\Phi=13.6°N$). From the analysis of the data 1953-1954, a sunspot minimum period, it was found that three types of sporadic, nam 1) *Esc* at 95–100 km, 2) *Esn* at 105–125 km, and 3) *Ess* at 115–125 km, occur in the *E* reg The overall behaviour of *Es* has been shown as being due to the combination of the chara istics of these three types. The sporadic ionization of type *Esc* has a maximum frequenc occurrence in the late evening hours, and has a thin structure. It is apparently evolved o a downward drift of the residual ionization of the normal E layer. No correlation coul established with meteor activity. *Esn* shows a minimum in the afternoon and maximu late-night hours before dawn. *Ess* is developed by the vertical downward movement of E2 layer. *Subject Headings:* **1. Ionospheric echoes 2. Sporadic E layer echoes 3. Ahm bad, India.**—*Author's abstract.*

7.10–135 551.510.535:551.5

Lovell, A. C. B., **A note on the interpretation of transient echoes from the ionosph** *Journal of Atmospheric and Terrestrial Physics*, London, 8(4/5):293 294, May **1956.** 6 refs. **DWB**—The midday maximum occurrence of transient echoes from meteor trai attributed to a maximum of meteoric activity at midday in summer, as shown by surv *Subject Heading:* **1. Ionospheric echoes.**—*C.E.P.B.*

7.10–136 551.510

Lyon, A. J. and Moorat, A. J. G., **Accurate height measurements using an ionosph recorder.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(6):309–317, June 1 8 figs., 6 refs., 3 eqs. **DWB**—The errors of the D.S.I.R. (Slough) ionospheric height reco are discussed. Checking of the calibration procedure is described, and a method is g for correcting errors in height measurement due to distortion of the echo-pulse in the recei With a calibrated receiver and expanded time-base, E region equivalent heights can be m ured to ±2 km. Without such correction systematic errors of +5 to 15 km are presen

t and M U F measurements at ionospheric stations all over the world. *Subject Heading:* **ospheric height measurement.**—*C.E.P.B.*

7.10–137 551.510.535:551.594.13

Ratcliffe, J. A., **The formation of the ionospheric layers F-1 and F-2.** *Journal of Atheric and Terrestrial Physics*, London, 8(4/5):260–269, May **1956.** 4 figs., 2 tables, 6 refs., s. **DWB**—Detailed investigations of the electron distribution in the F2 region have tly shown (RATCLIFFE et al., 1956) that the F2 layer could be formed by the ionizing y which has its peak of electron production in the F1 layer, if the loss-coefficient varies height in a certain way, explained in the paper referred to. The implications of a lossicient varying in this way are examined in detail in the present paper, and it is shown it would explain the known facts about the splitting of the F layer into separate F1 and yers. The question of what determines the height of the F2 electron peak is also dis-d. *Subject Headings:* **1. Ionospheric theory 2. Ionospheric electron density.**—*Author's act.*

7.10–138 551.510.535:551.594.7

Rawer, K., **Focusing on a "rippled" ionosphere.** *Journal of Atmospheric and Terrestrial ics*, London, 8(4/5):296, May **1956.** 4 refs., eq. **DWB**—Gives revised formulas for rical "ripples" showing values of $H/r$ for which focusing exists. *Subject Heading:* **1. Ionoric radio wave focusing.**—*C.E.P.B.*

7.10–139 551.510.535:551.557

Yerg, Donald G., **Observations and analysis of ionospheric drift.** *Journal of Atmospheric Terrestrial Physics*, London, 8(4/5):247–259, May **1956.** 5 figs., 5 tables, 4 refs., 12 eqs. **3**—Radio fading records at 3 spaced receivers at Mayaguez, Puerto Rico, on 2.33 and Mc/s are analyzed for drift. In Feb. drift tends to be to SW, but with considerable er; average speed 20 m/s at 2.33 and 17 m/s at 4.57 Mc/s. In June drift was more definite; n/s to NNE on 2.33 and 12 m/s between WNW and NNE on 4.57 Mc/s. A few observa-s in March (winter type) and April (summer type) are also shown. Diurnal variation is ussed. Fading resulting from random changes is always significant. The size and shape ue correlation pattern are considered. The correlation method used is more reliable than nethod of similar fades, which gives excessive velocities. *Subject Headings:* **1. Ionospheric 2. Puerto Rico.**—*C.E.P.B.*

## MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

*See also:* **Addition of momentum to simple current systems** (Tepper, Newstein), 7.10–193.

7.10–140 551.511:551.551

Chiu, Wan-cheng and Rib, Louis N. (*Dept. of Met. and Oceanog., New York Univ.*), **e of dissipation of energy and the energy spectrum in a low-speed turbulent jet.** *American hysical Union, Transactions*, 37(1):13–26, Feb. **1956.** 14 figs., 2 tables, 13 refs., 13 eqs. **B, DLC**—This paper reports a study of the correlation coefficients between eddy velocity ponents measured at two different points in space, the energy spectrum, and the rate of pation of energy in a low-speed turbulent jet. The result of this study shows that the l isotropy proposed by KOLMOGOROV prevails. It also gives the order of magnitude of mean rate of dissipation of energy. *Subject Headings:* **1. Energy dissipation 2. Turbulent 3. Kalmogorov's theory 4. Turbulence spectrum.**—*Authors' abstract.*

7.10–141 551.511:551.509

Dahler, Hermann (*Mitteldeutsche Wetterdienststelle, Leipzig*), **Neue Anschauungen über wetterwirksamen Vorgänge in der Troposphäre und deren Vorhersage. Teil II: Die sräumigen anisobaren Vertikalbewegungen. Abschliessende Betrachtung und Ausblick.** w theories on weather processes in the troposphere and their prediction, Pt. 2. Large-scale obaric vertical motions. Conclusion and prospect.] *Zeitschrift für Meteorologie*, 8(11/12):

323–352, Nov./Dec. **1954.** 6 figs., 94 refs., 21 eqs. **DWB**—A summary of this pape appended to Pt. 1 which appeared in *Zeit. für Met.*, 8(1), Jan. **1954** (*see* 6.4–124, April 1 *MAB.*) In this paper the author treats mathematically the importance of surface fricu advective temperature changes, vertical wind shear and ageostrophic mass influence anisobaric vertical motion. The most important weather processes, namely, the developn of frontal zones and jet streams, formation and displacement of low pressure regions, rapid slow weather types, deviations from the Norwegian cyclone model and cold lows aloft analyzed in terms of the aforementioned processes. The significance of the vertical c ponents of tropospheric flow in short range and medium range forecasting is conside *Subject Headings:* **1. Advective temperature change 2. Vertical motion 3. Anisob vertical motion 4. Weather forecasting.**—*I.L.D.*

7.10–142 551.511:519.

Dedebant, G. and Machado, E. A. M. (*both, Servico Meteorológico Nacional, Argenti* **Termodinâmica global de la atmósfera.** [Global thermodynamics of the atmosphe *Meteoros*, Buenos Aires, 5(1/2):19–34, Jan./June **1955.** fig., 3 refs., numerous eqs. Fre summary p. 19. **DWB, DLC**—Global thermodynamics considers the atmosphere as a sin uniform air particle and by treating it according to the general principles of thermodynam it extends the statistical mechanics of Gibbs to a nonuniform medium. Its application polytropic dry atmosphere is illustrated. *Subject Heading:* **1. Global thermodynamics of atmosphere.**—*I.L.D.*

7.10–143 551.

Dufour, L., **Sur les transformations adiabatiques et isobariques dans l'atmosph** [Adiabatic and isobaric transformations in the atmosphere.] *Belgium. Institut R Météorologique, Publications, Ser. B*, No. 15, **1954.** 10 p. 2 refs., 37 eqs. **DWB**—Theoret studies are presented of: 1) a general case of a closed system formed of two open system which mass exchanges can occur; 2) a special case of a system consisting of a humid air n and a mass of liquid; 3) a special case of a system consisting of a mass of saturated air and mass of nonsaturated humid air and 4) the case of a system comprised of two nonsatura air masses. *Subject Headings:* **1. Adiabatic processes 2. Saturation adiabat.**—*I.L.D.*

7.10–144 551.511 551.524:551.52

Jansa Guardiola, José Maria, **El "muro atmosférico."** [The "atmospheric wall *Revista de Geofísica*, Madrid, 14(53):35–50, Jan./March **1955.** 3 figs., 4 refs., eqs. **DW DLC**—The thermal exchange between the atmosphere and the earth or sea is discussed th retically and a detailed model presented. Horizontal and vertical currents, advecting h interchange with the ground turbulent exchange as well as radiative exchange at differ latitudes is treated semiquantitatively on the basis of theory and experience. A spher conducting shell wrapped around the earth, with a specific conduction of $10^7$ that of cop is proposed as a model. *Subject Headings:* **1. Energy exchange sea-atmosphere 2. Radiat exchange.**—*M.R.*

7.10–145 551.511:551.51

Lorenz, Edward N. (*M.I.T.*), **Available potential energy and the maintenance of general circulation.** *Tellus*, Stockholm, 7(2):157–167, May **1955.** 15 refs., 27 eqs. **DLC** The available potential energy of the atmosphere may be defined as the difference betw the total potential energy and the minimum total potential energy which could result fr any adiabatic redistribution of mass. It vanishes if the density stratification is horizontal statically stable everywhere, and is positive otherwise. It is measured approximately weighted vertical average of the horizontal variance of temperature. In magnitude i generally about 10 times the total kinetic energy, but less than one percent of the total tential energy. Under adiabatic flow the sum of the available potential energy and the kin energy is conserved, but the large increases in available potential energy are usually acc panied by increases in kinetic energy, and therefore involve nonadiabatic effects. Availa potential energy may be partitioned into zonal and eddy energy by an analysis of variance the temperature field. The zonal form may be converted into the eddy form by an ed

port of sensible heat toward colder latitudes, while each form may be converted into the ponding form of kinetic energy. The general circulation is characterized by a conversion nal available potential energy, which is generated by low-latitude heating and high-de cooling, to available eddy potential energy, to eddy kinetic energy, to zonal kinetic *Subject Headings:* **1. General circulation 2. Kinematics of westerlies 3. Eddy y of atmospheric circulation 4. Zonal kinetic energy.**—*Author's abstract.*

.10–146 551.511:551.515.1

Stümke, H., **Vergleich der Zustandsänderungen infolge Wärmezufuhr an eine adia-h bzw. isotherm geschichtete Atmosphäre.** [Comparison of changes of state as a result at advection to adiabatic or isothermally stratified atmosphere.] *Berlin. Freie Uni-it. Institut für Meteorologie und Geophysik, Meteorologische Abhandlungen*, 2(3):117 125, 6 figs., 2 refs. **DWB**—Small rotational symmetrical equilibrium changes produced by advection in an atmosphere with two adiabatically stratified layers can be represented in l form by means of Bessel functions. An example with extremely warm upper layers is lated on the basis of assumptions similar to those used in the case of an isothermally fied atmosphere (*Met. Rund.*, 1952; *see* 3.7–90, July 1952, *MAB*). Compared with tter, the example presented shows more intensive pressure and velocity fields (factor 3 in addition to characteristic definitions of isolines. The prognostic rule that a cyclone ens when the lability of its air masses increases by heating at the surface can be expressed e statement that the deepening of the cyclone will under conditions of equal heat advection eater the smaller is the initial stability of the vertical atmospheric stratification in the ne. *Subject Headings:* **1. Advection of heat 2. Cyclone development.**—*Based on author's ict.*

7.10–147 551.511:532.52:517.6

Thompson, Philip Duncan, **A theory of large-scale disturbances in non-geostrophic flow.** *nal of Meteorology*, 13(3):251–261, June 1956. 13 refs., 35 eqs. **DWB**—By a detailed sis of the motions of a linear system, it has been found that the omission of the total ative of the horizontal divergence from the divergence equation is necessary to exclude ty-wave solutions. In effect, this modification diverts all of the transformed internal and tial energy into the wave energy of the large scale disturbances. In slightly stronger , this type of modification is also *sufficient* to exclude gravity-wave solutions from the al nonlinear equations, and is essentialiy a generalization of the "filtering approxima-" introduced by CHARNEY (1948). The scheme proposed for integrating the modified inear equations is an iterative method, whereby a conditionally convergent sequence of oximate solutions can be generated from a known initial distribution of pressure. This od is applied to the solution of a system of equations which is one order of approximation er than the equations of quasigeostrophic motion, and provides the basis for a practicable od of numerical forecasting. *Subject Headings:* **1. Hydrodynamic equations 2. Inte-on techniques 3. Numerical forecasting.**—*From author's abstract.*

7.10–148 551.511:551.515.11

Vítek, Vojtěch, **Příspěvek k analyse horizontálního proudení v isobarické plosě.** [Con-ution to the analysis of horizontal currents on isobaric surfaces.] *Meteorologické Zprávy*. ue, 8(3):77–80, June 1955. 20 eqs., 3 refs. Russian and English summaries p. 77. B—The horizontal flow on an isobaric surface is theoretically analyzed. The resulting tion (8) is valid under the assumption that the absolute vorticity is different from zero. individual terms in equation (8) are called the pseudogeostrophic, pseudokinetic, anti-onary and pseudoconvectional wind. In these terms the sign of the absolute vorticity a substantial role. Therefore the existence of the negative absolute vorticity in significant optic systems, especially in tropical cyclones, is briefly discussed. The influence of vertical ility on the formation of tropical cyclones is quantitatively studied and the importance of tive absolute vorticity in the formation of the hydrodynamic unstable vortex with cyclonic ulation is discussed in agreement with SAWYER. Equation (8) is then applied to the kine-ic field of the developing tropical cyclone. *Subject Headings:* **1. Isobaric surfaces 2. Ab-te vorticity 3. Cyclone development.**—*Author's abstract.*

## GENERAL CIRCULATION

*See also:* **Antarctic atmos. circulation** (Lamb), 7.10–29; **High-level navigation** (Bannon, others), 7.10–49; **Westerly wave development** (Manabe), 7.10–103; **Potential energy and general circulation** (Lorenz), 7.10–145; **Hurricane season, S. Indian Ocean** (Rodewald), 7.10–163.

7.10–149 55

Girs, A. A., **K voprosu ob izuchenii obshcheĭ tsirkuliatsii atmosfery.** [Investigati the general circulation of the atmosphere.] *Akademiia Nauk SSSR, Izvestiia, Ser.* No. 4:16–28, July/Aug. **1955.** fig., refs. **DLC**—After reviewing various studies on circulation of the atmosphere carried out in the U.S.S.R. and in other countries durin past 15 years, the author analyzes G.IA.VANGENGEĬM's work on the atmospheric circula The dicussion covers the "centers of atmospheric activity," characteristics of the high low pressure belts, the distribution of highs and troughs in the Northern Hemisphere, varia in the intensity and variation of the jet stream, interaction and interdependence of atmosp processes of individual zones, changes in the thermal and dynamic characteristics of the u lying oceanic surface observed during each form of secular variation of the circulation an climatic changes occurring in individual regions of the globe. *Subject Headings:* **1. Ge circulation 2. Centers of action 3. Jet stream 4. Climatic variations.**—*I.L.D.*

7.10–150 551.513:551.524:53

Moore, J. G., **Cross-sections of the mean zonal component of geostrophic wind.** *Me logical Magazine*, London, 85(1008):167–171, June **1956.** fig., 7 refs. **DWB**—World c at levels 1000–100 mb (temperature to be published as a **Geophysical Memoir**) are us construct mean meridional cross-sections of potential temperature and zonal geostrophic from 90°–15°N in Jan., April, July and Oct. *Subject Headings:* **1. Potential temper 2. Zonal component of motion.**—*C.E.P.B.*

7.10–151 551.

Grandoso, H. N. and Núñez, J. E. (*both, Diréccion General de Circulación Aérea y dinamica*), **Análisis de una situación de bloqueo en la parte austral de América del Sur.** [ ysis of a blocking situation in the southern part of South America.] *Meteoros*, Buenos 5(1/2):35–54, Jan./June **1955.** 13 figs. (incl. maps), 4 tables, 11 refs. English summary **DWB, DLC**—A case study of a blocking situation in the southern part of South Amer analyzed. Its main features are the formation of a stationary warm anticyclone at latitudes with a maximum mean 10-day surface pressure anomaly of plus 30 mb and successive development of several cold cyclonic vortices at lower latitudes. The flow pa corresponded to what is known as a "difluent blocking" type. This study is presente spite of insufficient data for a complete analysis in the upper levels due to the importan the processes of blocking in the Southern Hemisphere general circulation which has a str zonal character than that of the Northern Hemisphere. *Subject Headings:* **1. Blocking a 2. Warm anticyclones 3. South America.**—*Authors' abstract.*

7.10–152 551.513.2:55

Alaka, M. A., **Case study of an easterly jet stream in the tropics.** Chicago. Dept. of Meteorology, Contract N6ori-02036, (unnumbered) Technical Report, March 24 p. 14 figs., 2 tables, 17 refs., 15 eqs. **DWB**—By means of cross sections (both time space) for the Caribbean radiosonde stations or area, 500 and 200 mb contour charts, 20 streamline or isotach charts, meridional cross sections to 100 mb level, cloud cover, and rela vorticity charts for period Aug. 1–4, 1953, a case history of an easterly jet and its moveme is analyzed and attending weather conditions interpreted. Wave motions, wind field, s organized convective activity, thermal and dynamic structure are treated with respe position of maximum jet concentration (or vice versa). *Subject Headings:* **1. Easterly stream 2. Tropical analysis 3. Caribbean Region.**—*M.R.*

7.10–153 551.513.2:551.557:551.524.7

Boville, B. W.; Creswick, W. S. and Gillis, J. J. (*all, Central Analysis Office, Montreal*), **ontal-jet stream cross section.** *Tellus*, Stockholm, 7(3):314–321, Aug. 1955. 6 figs., fs., eqs. **DLC**—The validity of the thermal wind relationship for determining high level ls in the vicinity of jet streams is discussed. A cross section wind field was constructed zing only the thermal field for levels above 700 mb. This wind field is compared to one tined from rawin reports. The results indicate that a reasonable picture of the high level winds is obtained when vertical extrapolation is based on the thermal field analysed with pect to three-dimensional fronts. *Subject Headings:* **1. Jet stream theory 2. Thermal d field.**—*Authors' abstract.*

7.10–154 551.513.2:551.515.8

Mildner, P., **Über den Zusammenhang zwischen der Polarfront in den höheren Schichten r Troposphäre und der Entwicklung und Bewegung der Bodendruckgebilde.** [The relation- o between the polar front in the higher layers of the troposphere and the development and vement of surface structures.] *Berlin. Freie Universität. Institut für Meteorologie und physik, Meteorologische Abhandlungen*, 2(3):105–116, 1954. 5 figs. **DWB**—By means of eral examples, the author clarifies the behavior of the surface pressure forces such as highs l lows which develop under the influence of the transition zone between polar and tropical as in the upper troposphere, and shows that from the movement of surface pressure con- uration it is possible to form an approximate idea of the geopotential field in the upper ers of the troposphere. An example of rhythmic repetitions of an atmospheric process is sented. *Subject Headings:* **1. Atmospheric circulation 2. Polar fronts 3. Barometric pressions.**—*Author's abstract.*

7.10–155 551.513.2:551.557:551.501.7

Saucier, W. J. and Riehl, Herbert, **Exploration of the jet stream by aircraft during the 52/1953 winter.** *Journal of Meteorology*, 13(3):312–314, June 1956. 2 refs. **DWB**—ferring to the paper by RIEHL and others (*see* 6.5–123, May 1955, *MAB*), Saucier criticizes rejection of aircraft or rawin winds owing to differences between them. He suggests that ny of the differences are due to microstructure. RIEHL replies that the tolerance limit of ° direction and 1/10 wind speed for microstructure is liberal and is justified by recent knowl- ge. *Subject Headings:* **1. Aircraft weather reconnaissance 2. Jet stream.**—*C.E.P.B.*

## ATMOSPHERIC DISTURBANCES

*See also:* **Tornadoes** (Delver), 7.10–9; **Antarctic atmos. circulation** (Lamb), 7.10–29; **Thunderstorms and electricity supply** (Prentice), 7.10–62; **Atmos. disturbances forecasting** (Gião), 7.10–97; **Westerly wave development** (Manabe), 7.10–103; **Changes of state due to heat advection** (Stümke), 7.10–146; **Horizontal currents on isobaric surfaces** (Vítek), 7.10–148; **Polar front and development of surface structures** (Mildner), 7.10–154; **Prediction of extreme turbulence** (Bates), 7.10–199; **Upper-level frontogenesis** (Pothecary), 7.10–216; **Middle cloud layer** (Kimachi), 7.10–229; **Electric field under thunderstorms and tornadoes** (Gunn), 7.10–291; special bibliography on **Hurricane and Storm Surge Damage**, p. 1270.

7.10–156 551.515.1

Gaffney, D. (*W. Australia Div. Office, Perth*), **Aspects of summer troughs in Western ustralia.** *Australian Meteorological Magazine*, Melbourne, No. 9:1–13, June 1955. 15 figs. **WB**—Three cases are examined of troughs developing in the summer of 1953–54. The first presents a rapid development and eastward movement characteristic of early and late mmer; the second a more persistent type occurring frequently in midsummer; and the ird a variation of the second. The cases considered are typical of troughs which present oblems of prognosis, but they do not cover the whole field. Their significance in relation to recasts of temperature in the Perth region is brought out, and the article draws attention some criteria which the author has found useful in indicating when the trough would com-

mence a steady eastward movement. *Subject Headings:* **1. Troughs 2. Western Austr** —*Author's abstract.*

7.10–157 551.5

McCutchan, Morris H. and Bryson, Reid A., **On the quantitative characterization of pressure centers.** Wisconsin. Univ. Dept. of Meteorology, Contract AF 19(604)- Scientific Report No. 3, June **1955.** 15 p. 14 figs., table, 4 refs., 30 eqs.—In this stud attempt was made to find a parameter which might quantitatively characterize a syno low pressure system, making certain simplifying assumptions and using the circula theorem, that the mean absolute vorticity distribution within a low follows a law of the f $\xi_a = CA^k$ where $C$ and $k$ are constants and $A$ is the area within which the vorticity is measu For a given storm it was found that $\xi_a$ was constant in time for a given storm, and tha changed little during the life of the storm. However, $\xi_a$ changed from storm to storm. of this rule for short term prognosis was then considered. *Subject Headings:* **1. Barome depressions 2. Circulation theorem 3. Pressure forecasting.**—*A.A.*

7.10–158 551.51

Newton, C. W., **Investigation of cyclone development, Storm No. 5.** Chicago. U Dept. of Meteorology, Contract AF 19(604)-1293, Technical Report, No. 3, April **1955.** 4- 15 figs., 17 refs., eqs.—"The development, behavior and dissipation of a major cyclone o the United States during 16 to 21 Nov. 1948 is investigated in detail." It is characteristi a type of cyclone observed east of the Rocky Mountains. The discussion includes an anal of the surface synoptic situation and the upper flow pattern at 300 mb; the relation betw the 300 mb vorticity pattern and surface development hemispheric flow patterns; the vortic vertical velocity and divergence over the cyclone center; the orographic effects includ surface vertical motion in relation to cyclogenesis and the quantitative distribution of ther contributions to low-level cyclogenesis; the relation between the patterns of vertical moti at 100 mb and precipitation patterns. In an appendix the author presents the mathemati procedures for computing: 1) the vertical motion and divergence from vorticity chang 2) the divergence over the cyclone center only and 3) vertical motions at the earth's surfa *Subject Headings:* **1. Cyclone development 2. United States.**—*I.L.D.*

7.10–159 551.515.11:551.558:551.510

Pogosian, Kh. P. and Burtsev, A. I., **Vliianie vertikal'nykh dvizhenii vozdukha na izme enie termicheskogo polia troposfery.** [Effect of vertical air movements upon the therm fields of the troposphere.] *Meteorologiia i Gidrologiia*, Moscow, No. 3:8–15, May/June 19 4 figs., 3 tables, 8 refs. **DWB**—The results of calculations of different advective and n advective influences in the change of the thermal field of the troposphere during meridio transformation of the thermobaric field of the troposphere and the development of a cyclo producing considerable precipitation during the period Oct. 27–30, 1952 over northweste and central Europe and European Russia are reported. The surface weather map and t thermobaric field of the lower half of the troposphere associated with the cyclone of Oct. 1952 during its development are shown and the changes in the thickness layers $H\frac{500}{1000}$ a given in tables. It was found that changes in the structure of the thermal field of the tro sphere occur not only as a result of advective heat but also of nonadvective temperatu changes due to vertical motion. It follows that the magnitudes of the temperature chang differ in different parts of the thermobaric field. Nonadvective thermobaric changes must considered in the transformation of the thermobaric field of the troposphere. *Subject Headin* **1. Cyclone dynamics 2. Tropospheric advection 3. Vertical current effects.**—*I.L.D.*

7.10–160 551.515.

Spar, Jerome, **Notes on east-coastal cyclogenesis. Summary.** American Meteorologic Society and Royal Meteorological Society, **Proceedings of the Toronto Meteorological Co ference, Sept. 1953,** pub. 1954. p. 144. **DWB**—Upper air analysis of initial phases of cycl genesis on east coast of U. S. shows departures from model behavior and structure. Te perature relations are discussed. *Subject Heading:* **1. Cyclogenesis.**—*C.E.P.B.*

7.10-161 551.515.11:551.511

§Spar, Jerome, **Vorticity development in the cyclone of Nov. 6, 1953.** N. Y. Univ. llege of Engineering. Research Div. Dept. of Oceanography and Meteorology, Contract ır-285(09), Progress Report, No. 3, Jan. **1956.** 34 p. 12 figs., 3 tables, 2 refs. **DWB** – rajectory method is used to evaluate the terms in the vorticity equation at 700, 500, 400 300 mb in the east coastal cyclones of Nov. 6, 1953. The computed divergence and tical transport terms do not account quantitatively for the observed vorticity development the isobaric surfaces. This appears to be due to inherent inaccuracies in the computations, ecially of the vertical motions, and to effect of tipping, eddies and scale. A synoptic lysis of the 500 mb level indicates that the vorticity associated with the upper level cyclone generated mainly above 500 mb by convergence, and may be transported downward by e scale subsidence. The vertical cross-sections through the baroclinic cyclone show a ping surface of maximum divergence separating the convergence near the tropopause, ich generates the vorticity for the upper cyclone, from the low level frontal convergence ich maintains the sea level cyclone. *Subject Headings:* **1. Cyclone analysis 2. Vorticity relopment.**—*Author's abstract.*

7.10–162 551.515.13(261/2)

Gleeson, Thomas A., **A comparison of cyclone frequencies in the North Atlantic and editerranean regions.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A,* enna, 9(2):185–190, **1956.** 3 figs., table, 2 refs. English, German and French summaries 185. **DWB.** Also issued as: Florida. State Univ. Dept. of Meteorology, Contract 19(122)-466, Scientific Report, No. 8, May 15, **1955.** 12 p. 3 figs., 2 refs.—An inverse ation between cyclogenesis along E. coast of N. America and in Mediterranean region is ubtful because of time lag. A significant inverse relation is found between cyclone frequency eastern N. Atlantic and in W. Mediterranean, but no relation between frequency of cyclones ossing 70°W and that in E. Atlantic. *Subject Headings:* **1. Cyclone frequencies 2. North lantic 3. Mediterranean Sea.**—*C.E.P.B.*

7.10–163 551.515.23:551.513

Rodewald, M., **Die Orkan-Saison im südlichen Indischen Ozean.** [The hurricane ason in the S. Indian Ocean.] *Wetterlotse,* Hamburg, No. 97:34–36, Feb. **1956.** fig. **DLC**— n Jan. 25, 1956, a hurricane moved south along the E. coast of Madagascar, a rare track. DEWALD remarks on the recent more northerly direction of hurricane tracks along the east ast of North America, which NAMIAS attributes to changes of the atmospheric circulation. *bject Headings:* **1. Hurricane tracks 2. Atmospheric circulation changes.**—*C.E.P.B.*

7.10–164 551.515.8:550.342(988,491,48)

Båth, Markus (*Met. Inst., Univ. of Uppsala*), **Comparison of microseisms in Greenland, eland and Scandinavia.** *Tellus,* 5(2):109–134, May **1953.** 11 figs., 18 refs. **DLC**— icroseismic amplitudes and periods recorded at Scoresby-Sund, Reykjavik, Bergen and Upp- la in seven different cases from the years 1949–1950 are studied. At all stations the polar r is of essential importance for the generation of microseisms, whereas there is in general no ose connection with the cyclone centers themselves. A coast effect is of importance for candinavia, whereas the source for microseisms recorded at Scoresby-Sund is located over e open ocean within the polar air. Standing ocean waves may be of importance at the orwegian coast but in many cases not on the open ocean. The microseismic waves propagate uch farther over the continent than along the ocean bottom. The microseismic periods in candinavia vary generally in parallelism with the amplitudes, in Iceland and Greenland enerally not. Period minima and rapid amplitude increases are observed in Scandinavia hen cold fronts cross the Norwegian coast. There is no sign of microseismic barriers in the tlantic outside Scandinavia. The microseisms at Scoresby-Sund have a regular, group haracter; at the other stations they are generally continuous. *Subject Headings:* **1. Micro- eisms 2. Polar fronts 3. Greenland 4. Iceland 5. Scandinavia.**—*Author's abstract.*

7.10–165 551.515.8:551.515.13

§Gregor, Zdeněk, **Vliv front na pohyb výškové cyklony, která se nalézá na jih od západo- východní cirkulace.** [The effect of fronts on the movement of an upper-air cyclone situated

south of a west-to-east circulation.] *Meteorologické Zprávy*, Prague, 5(1):30, **1952.** 3 ch
**DLC**—Case history of a cyclone which moved west over England and the Atlantic and t
changing its direction, moved east to the south of France. The shift in direction was ca
by an occluded front which moved over from an American upper-air cyclone into the Euro
one. A chart of the cyclone's trajectory covering nine days, and two 500 mb pressure ch
are included. *Subject Headings:* **1. Synoptic studies 2. Cyclone tracks 3. Frontal pas
effects 4. England 5. France.**—*G.T.*

# RADIATION AND TEMPERATURE

## RADIATION

*See also:* **Cosmic-ray observations** (Cranshaw, others), 7.10–1; **Cosmic ray increase** (Fenton, others), 7.10–26; **Photometric unit for airglow** (Hunten et al.), 7.10–67; **Effective radiation measurements** (Lönnqvist), 7.10–68; **Condensation nuclei produced by UV** (Atkinson), 7.10–220; **Solar radiation during eclipse of June 30, 1954** (Dogniaux),7.10–278.

7.10–166 551.5

†**Meteorological aspects of solar radiation.** *Meteorological Magazine*, London, 85(10
112–116, April **1956.** table, 11 refs. **DWB**—G. J. Day, opening the discussion, descr
the spectral distribution and intensity of solar radiation, the flux in free space, recent
terminations of albedo of cloud, land and sea, and modifications of the remaining 60%
the earth and its atmosphere and effects on temperature and evaporation. Six estimates of
mean energy transport across lat. 40° ranged from 2.4–4.9×$10^{27}$ erg/day. He then descri
instruments for measuring solar radiation. Altogether a useful short summary. The
cussion dealt mainly with practical applications. *Subject Headings:* **1. Solar radiation eff
2. Albedo. I. Day, G. J.**—*C.E.P.B.*

7.10–167 551.521.11:551.5

Mörikofer, Walter and Nagel, Erich, **Über die Beziehung zwischen Sonnenscheindau
und Bewolkung.** [The relationship between sunshine and cloudiness.] *Schweizeri
Naturforschende Gesellschaft, Bern, Verhandlungen*, **1952**:112–113. **DLC**—The adequacy
the formula $S+B=100+D$ which expresses the sum of relative sunshine durations in
and of cloudiness in % is considered. The determination of the average annual value o
(deviation) on the basis of stations for which both sunshine recording and cloud observati
are available is discussed. *Subject Heading:* **1. Sunshine-cloudiness relationships.**—*I.L.D*

7.10–168 551.521

§Rein, František, **Sluneční svit na Milešovce v letech 1945–1954.** [Sunshine durat
at Milešovka, 1945–1954.] *Meteorologické Zpravy*, Prague, 8(6):154–159, **1955.** 2 fi
10 tables, 4 refs. Russian and German summaries p. 154. **DWB**—Sunshine duration d
obtained at Milešovka Observatory (50½°N, 14°E, 850 m alt.) during a 10-year period
analyzed. The values tabulated and discussed are: 1) monthly totals of sunshine durati
2) average duration for each pentad of the year, 3) extreme values of sunshine durati
4) diurnal variations of sunshine duration for each month, 5) monthly frequencies of specif
sunshine duration values, 6) days without sunshine, 7) statistical values of monthly avera
and 8–10) periods with unusually long or unusually short sunshine duration. The ann
variation of sunshine duration is graphically represented and eight singularities (4 positive a
4 negative) are identified. *Subject Headings:* **1. Sunshine duration data 2. Singularit
3. Milešovka, Czechoslovakia.**—*G.T.*

7.10–169 551.521.14:551.4

Kondrat'ev, K. IA. and Kudriavtseva, L. A., **K voprosu ob al'bedo poverkhnosti mor**
[Albedo of the sea surface.] *Meteorologiia i Gidrologiia*, Moscow, No. 3:25–27, May/Ju
**1955.** fig., table, 2 refs., 2 eqs. **DWB**—Since Frenkel's formula for calculating theoretica
the albedo from oceans, seas and lakes is valid only for direct solar radiation, the auth

sents the results of calculations of albedo of a smooth sea surface for diffuse and total iation in the case of a cloudless sky. Counter radiation was not taken into account. The mula $A = 0.027 + 0.00021\zeta e^{4.98}$ $(\pi/2 - h_0)$ is recommended for the calculation of albedo from ooth water surface. *Subject Headings:* **1. Albedo of sea surfaces 2. Diffuse radiation.** *I.L.D.*

7.10–170 551.521.14

Penndorf, Rudolf (*Geophysics Res. Directorate, A.F. Cambridge Res. Center, Bedford, ass.*), **Luminous reflectance (visual albedo) of natural objects.** *American Meteorological ciety, Bulletin*, 37(4):142–144, April **1956.** table, 5 refs., eqs. **DWB, DLC**—The spectral lectance of natural objects is taken from KRINOV's measurements (*see* 3.3–131, March 1952 d 7G–12, July 1956, *MAB*). Based on these data, the luminous reflectance (visual albedo) computed for natural objects. The results obtained are compared with other published ta. The wealth of data can now be grouped into four classes and twenty-four main types. he luminous reflectance of most natural objects (except snow and a few rock formations) mains below 15%. *Subject Headings:* **1. Spectral reflectivity 2. Visual albedo.**—*Author's stract.*

7.10–171 551.521.31

Berg, Otto E. (*Naval Res. Lab., Wash., D. C.*), **Day sky brightness to 220 KM.** *Journal Geophysical Research*, Wash., D. C., 60(3):271–277, Sept. **1955.** 5 figs. (incl. photos), 4 refs. **LC**—The brightness of the daytime sky has been measured using rocket-borne stereocameras. n upper limit of 0.0075 candle/ft² was found for the brightness at altitudes ranging from 80 220 km. This limit is consistent with the brightness being due entirely to Rayleigh scatter- g. No evidence of high altitude clouds was found. *Subject Heading:* **1. Daytime sky ightness.**—*Author's abstract.*

7.10–172 551.521.4:535.33

†§Barbier, D. (*Inst. d'Astroph., Paris*), **Analyse du spectre du ciel nocturne.** [Analysis the night sky spectrum.] *Annales de Géophysique*, Paris, 11(2):181–208, April/June **1955.** figs., 10 tables, 74 refs. **DLC**—A comprehensive survey of present knowledge of night air- low. The following topics are discussed: 1) airglow spectrographs, 2) publications, 3) un- lentified radiation lines, lines near 3550 Å, intensity variations, absorption spectrum, emission pectrum of airglow, continuous emission spectrum, atomic lines, Meinel OH rotation-vibra- ion bands, atmospheric $O_2$ systems (red systems, Herzberg systems), molecular $O_2$ systems, egative $N_2$ systems, Vegard-Kaplan $N_2$ systems and other systems. *Subject Heading:* **1. Night irglow spectrum.**—*M.R.*

7.10–173 551.521.4:551.594.51

Elsässer, H. and Siedentopf, H., **Die Emissionhöhe der 5577 AE-Linie des Nachthim- nelsleuchtens nach Messungen am Jungfraujoch.** [The height of emission of the 5577 line f the air-glow as observed on the Jungfraujoch.] *Journal of Atmospheric and Terrestrial hysics*, London, 8(4/5):222–232, May **1956.** 6 figs., table, 10 refs., 11 eqs. English summary . 222. **DWB**—The multiplier-photometer is described and illustrated; the filter transmitted 4% at 5590 Å. Observations were made on 10 nights in winter 1954/55 at the Sphinx Ob- ervatory (3575 m). The intensity variation of the green auroral line [OI] 5577 between enith and horizon was measured on the north and south sides. The mean height of the mission layer was calculated as 90±10 km; a height difference of 40 km between north and outh may not be real. *Subject Headings:* **1. Night airglow 2. Green auroral line, Jung- rauhoch, Switzerland.**—*C.E.P.B.*

7.10–174 551.521.63:612

Schulze, Rudolf, **Medizin-meteorologische und strahlungsphysikalische Untersuchungen zur Ultraviolett-Strahlung.** [Investigations into the medical meteorology and radiation physics of ultraviolet radiation.] *Meteorologische Rundschau* Berlin, 9(3/4):43–47, March/ April **1956.** 10 figs., 2 tables, 5 refs. **DLC**—Investigations into pigmentation and production of erythema by solar and artificial UV radiation at Hamburg are described, and also the effect

of radiation on surface heating and on assimilation of $CO_2$ by plants. The Larché sp
for measuring UV radiation (types A and B) is illustrated and tests with it shown and explai
Biological and medical effects are discussed. *Subject Heading:* **1. Ultraviolet radiation effe**
—*C.E.P.B.*

7.10–175 551.521.64:551.594.6:523

McKerrow, C. A., **Sudden decrease in low-frequency atmospheric noise during cosmic-radiation storm of February 23.** *Nature*, London, 177(4522):1223-1224, June **1956.** fig. **DWB**—At Churchill, Manitoba, a sudden decrease of 100 kc/s noise occurrec 0345 G.m.t. Other observations are compared and it is concluded that "for this solar f there appeared to be a sudden increase in the D region absorption on the darkened half of hemisphere which cannot be attributed to ultraviolet radiation. It also appears that condition may occur only at high latitudes situated near the auroral zone." *Subject Headir* **1. Cosmic ray variations 2. Radio noise 3. Solar flares 4. Churchill, Manitoba.**—*C.E.P*

7.10–176 551.521.64:523.

Possener, M. and van Heerden, I. J., **The daily variation of the cosmic ray intens measured near the 1954 sunspot minimum.** *Philosophical Magazine*, London, Ser. 8, 1(3):25 260, March **1956.** 5 figs., 7 refs. **DWB**—The ionizing component of cosmic radiation at level at Manchester was measured with counter telescopes pointing 45°N and S, and a neutr monitor. The mean solar daily variations for N and S directions are plotted for 1948, 19 1952 and 1953. The maximum gradually moved from 15 h to 10 h and became much weak in June–Sept. 1953 it occurred near midnight. The phase difference between the N and curves decreased. In June 1954 the instruments were set up vertically in London, the ma mum changed from 10 h to 6 h in Aug.–Sept. The neutron monitor showed nearly ze amplitude in June–Nov. No similar change was found in records for the sunspot minimu of 1944. *Subject Headings:* **1. Cosmic ray diurnal variations 2. Sunspot effects.**—*C.E.P.B*

7.10–177 551.521.64:523.

Steinmaurer, R., **Ein ungewöhnlicher, plötzlicher Intensitätsansteig der kosmisch Strahlung.** [An unusual sudden increase of cosmic radiation.] *Naturwissenschaften*, Berli 43(8):174, April 15, **1956.** fig., 7 refs. Also: Messerschmidt, W., **Ultrastrahlung von d Sonne.** [Cosmic radiation from the sun.] *Ibid.*, p. 174. ref. **DWB**—1) Records of cosm radiation on Hafelekar (2300 m) near Innsbruck showed an exceptional increase betwe 3 and 4 h world time on Feb. 23, 1956. It accompanied a great solar eruption but there we no ionospheric or geomagnetic effects. 2) The chromosphere eruption and increase of cosm radiation on Feb. 23, 1956, at Weissenau are described. *Subject Headings:* **1. Cosmic ra variations 2. Solar flares.**—*C.E.P.B.*

## TEMPERATURE

*See also:* **Interdiurnal temp. changes, Alaska** (Cushman), 7.10-8; **Effect of temp. on wheat** (Geslin), 7.10-53; **Memorandum on atmos. temp. variations** (de May), 7.9–60; **Cold Feb. 1956** (Faust), 7.10–107; **Atmospheric wall** (Jansa Guardiola), 7.10–144; **Mean zonal component of geostrophic wind** (Moore), 7.10-150; **Jet stream** (Boville et al.), 7.10–153; **Thermal balance of soil surface** (Dobosi), 7.10–189; **High pressure changes as function of temp.** (Faust), 7.10–195; **Frequency of infralong waves and pressure and temp. changes** (Reiter), 7.10-196; **Snowfall and temp.** (Gold, Williams), 7.10–244; **Unusual April 1955 weather** (Berkes), 7.10–248.

7.10–178 551.524:551.526.

Pokrovskaia, T. V. and Rubinshteĭn, E. S., **K voprosu ob izuchenii teploobmena mezhd okeanami i materikami.** [Heat exchange between oceans and continents.] *Meteorologiia Gidrologiia*, Moscow, No. 3:56-58, May/June **1955.** 6 refs. **DWB**—A criticism of S. T Pagava's division of the Northern Hemisphere into natural synoptic regions on the basis o heat exchange between oceans and continents which is characterized by lines of equal deviation

mean latitudinal temperature. It is pointed out that PAGAVA's assertions that in Jan. principal heat flow is directed from the Norwegian Sea to Kazakhstan perpendicularly e isoanomalies, that the flow of heat into the Lena basin is from the Northwest Pacific n, etc. are shown to be erroneous. *Subject Headings:* **1. Energy exchange sea-atmosphere. gava, S. T.**—*I.L.D.*

7.10–179 551.524.33 517.512.2 551.553.6:551.551

Griffith, H. L.; Panofsky, H. A. and Van der Hoven, I., **Power-spectrum analysis over ranges of frequency.** *Journal of Meteorology*, 13(3):279–282, June **1956.** 4 figs., , 4 refs., eq. **DWB**—The method of computing power spectra by autocorrelation is narized and a way of shortening the computation described. Spectra are given of cycles nour of vertical velocity at Brookhaven, showing a peak about 1½ min, and periodicities ily mean temperature at University Park, Pa. The latter shows large peaks at 4 and ays. *Subject Headings:* **1. Periodogram analysis 2. Temperature periodicities 3. Gust iencies.**—*C.E.P.B.*

7.10–180 551.524.33:517.512.2

Mavridis, Lyssimahos (*Univ. of Thessalonike*), **On the mathematical expression of the ial variation of air temperature.** *Thessalonike. Panepistēmion. Ergastērion Me-lias, Meteorologika*, No. 3, **1954.** 44 p. fig., 4 tables, 7 refs., 23+eqs. **DWB**—Observed calculated values of mean monthly temperature for sunspot periods from 1776–84 to –44 for Prague and Vienna and 1799–1810 to 1934–44 for Copenhagen, and 1799–1810 924–33 for Berlin are tabulated to show the seasonal variations in temperature from one period to another when computed by the method of J. XANTHAKIS (1948–1953) and by harmonic analysis method. It is shown that the constants for mean annual temperature variability of temperature are almost the same whether computed by the theoretical monic) method or by the empirical (successive approximation) method of XANTHAKIS. *ject Headings:* **1. Seasonal temperature variations 2. Harmonic analysis 3. Successive oximation method 4. Long period records 5. Europe.**—*M.R.*

7.10–181 551.524.7:523.74

Lowenthal, M. J. and Newkirk, Gordon, Jr., **Temperature anomalies aloft and their elation with solar activity, 1952–1954.** *U. S. Signal Corps Engineering Laboratories, Monmouth, N. J., Technical Memorandum*, No. 1692, Sept. 1, **1955.** 10 p. 7 figs., 9 tables, fs. **DWB**—Data are presented for three periods covering high-altitude temperature rises rved at Belmar, N. J., during the winter 1953–54. The occurrence of a temperature rise ears to be related to the dynamics of the air at the high altitudes and to solar phenomena. examination of solar activity data about the time of eight temperature-rise episodes suggests following relations to solar phenomena: 1) absence of flares for the week preceding the peak perature well beyond absences expected from chance and 2) undisturbed areas appearing he solar meridian more frequently during the week preceding the peak temperature day. *ject Headings:* **1. Upper air temperature anomalies 2. Solar activity.**—*Author's abstract.*

7.10–182 551.524.35

Péczely, György, **A föld hőmérsékletének változása.** [Change of temperature of the h.] *Időjárás*, Budapest, 59(5):275–281, Sept./Oct. **1955.** 2 figs., 2 tables, 9 refs. Russian German summaries p. 275. **DLC**—Anomalies in annual mean temperature during the od 1881–1940 are determined for the various geographical zones and for the entire globe. nperature is found to have increased during the entire period and more particularly after 0. It is shown that this could not have been caused by an increase of the solar constant, the two increases are not concurrent. The possibility of an effect of carbon dioxide is d out by the fact that the existing $CO_2$ amount already produces the highest possible orption. An increase in water vapor content, due to small variations of the solar constant, uggested as a probable factor. *Subject Headings:* **1. Temperature anomalies 2. Global nperature changes.**—*Trans. of author's abstract.*

7.10–183 551.524.36:551.5

Georgii, Hans-Walter, **Über die nächtliche Abkühlung der Luft in kleinen G** [On the nocturnal cooling of the air in small pits.] *Meteorologische Rundschau*, 9(5/6):99–102, May/June 1956. 3 figs., table, 6 refs. **DLC**—In night observations in excavations it was found that the minimum temperature 5 cm above the floor was often than over the neighboring plain. This was confirmed in two 60 cm pits at Frankfurt, th of one vertical and of the other 30° to the horizontal, the difference being greater in the and on radiation nights. The reasons were heat advection from the walls, and, in the p vertical walls, less effective outward radiation. Against this is a local circulation set up warmer air. *Subject Headings:* **1. Nocturnal cooling 2. Microclimatology of pits.**—*C.E.*

7.10–184 551.524.37:6

†Burckhardt, Hans, **Probleme und Möglichkeiten zur Kartierung der Frostgefähr** [Problems and possibilities of mapping frost risk.] *Meteorologische Rundschau*, 9(5/6):92–98, May/June 1956. 41 refs. **DLC**—The basis of frost charting is consi Advantages of a network of exposed, sheltered or aspirated thermometers at 5–90 cm the ground (preferably several heights) and other methods are discussed, also tempe profiles and the presentation and interpretation of the data. "Eye and ear" charts c compiled from surveys and reports of crop damage but should be made objective by instrum observations at selected points. Other indicators are valley fog and smoke, rime anc plant associations. Frost damage in different crops, especially vine, can be charted. map should be used as a basis. *Subject Heading:* **1. Frost danger charting.**—*C.E.P.B.*

7.10–185 551.524.

Rodewald, M., **Der merkwürdige Winter 1956.** [The remarkable winter of 1 *Wetterlotse*, Hamburg, No. 98:37–50, March 1956. 8 figs. **DLC**—As late as Jan. 25 unus mild weather persisted in Germany and flowers were in bloom. Maps show mean ten atures and departures from normal in N.W. and N. Europe in Nov., Dec. 1955, Jan. and 1956. Development began in northern Gulf of Bothnia, which was colder than norm Nov., with heavy ice by Dec. 1. In Dec. the cold intensified (Haparanda 9°C below no and in Jan. persisted, but the German coast was still above normal. In late Jan. the spread rapidly southward and in Feb. N. Germany was 9°C below normal. *Subject Hea* **1. Severe winters 2. Europe.**—*C.E.P.B.*

7.10–186 551.524.7:55

Berggren, R., **Correlation between the 500-mb. temperature and the 500–300-mb. 500–400-mb. thicknesses.** *Meteorological Magazine*, London, 85(1008):171–175, June 8 tables, 4 refs., 11 eqs. **DWB**—Correlation coefficients between 500 mb temperature T°C 500–300 mb thickness at Torslanda, Sweden, $a$(gpm) range from 0.95 in May to 0.89 in Regression equations are given for each month, generalized as: June–Nov. $a=12.83\,T+38$ Dec.–May $a=11.14T+3979.9$. Comparisons are made with R. MURRAY's formula Larkhill and Lerwick. The investigation is repeated using 500–400 mb thickness, gi coefficients of 0.987 (Dec.) to 0.934 (April); regression equation $a=6.43\,T+1742.8$. T relations can be used to draw 300 and 400 mb charts. *Subject Headings:* **1. Pressure computation 2. Upper air temperature-pressure correlation.**—*C.E.P.B.*

7.10–187 551.524.7

Pietrzykowski, Kazimierz, **Variación de la temperatura de la atmósfera en la Argen** [Variation of atmospheric temperature in Argentina.] *Meteoros*, Buenos Aires, 5(4):363– Oct./Dec. 1955. 5 figs. Spanish and English summaries p. 363. **DWB**—The existing u air observations with the use of aerometeorographs for the area covering Buenos Aires provi Central Argentinian zone, S of Litoral and region of Cuyo have been examined. These servations are of a very small number (altogether about 600) and some of them seem errone however the calculated mean values of temperature at 900, 800, 700 and 600 mb, as wel some deviations, are in a fairly good accordance with the data obtained from high moun stations and other available upper air observations. *Subject Headings:* **1. Upper air tempera variations 2. Argentina.**—*Author's abstract.*

7.10–188 551.524.7:551.508.822

*Veikko, Rossi (*Meteorologische Zentralanstalt, Helsinki*), **Beobachtungen über den täglichen mperaturverlauf in der Stratosphäre.** [Observations on the daily temperature conditions he stratosphere.] *Geophysica*, Helsinki, 4(4):218–225, **1954.** 4 tables, 7 refs. **DWB**— lies show that the radiation error is dependent on the height of the sun, the pressure and rate of ascent. The present data and similar studies by CRAIG (1951), GROBER (1953) others show that the diurnal change at 100 to 25 mb is <1°C and about 0.5°C as a rule. ce the radiation correction can be assumed (as VÄISÄLÄ has done) to be the difference veen the night and the daytime ascents. From April 8 to 14, 1951 radiosonde observations e made at Ilmala, Finland (60°12′N) at 03, 04:30, 06, 10:50, 11:45, 16:30, 18, 19:30 and 00 EUT with Finnish radiosondes. Three observations were in dark (19:30, 23 and 03) the rest in daylight. The other observations were paired so the sun was at the same ht (horizon, 10° and 35°) at 100 to 50 mb, on the a.m. and p.m. observations, respectively, hat the radiation error could be controlled. *Subject Headings:* **1. Radiosonde corrections Radiation error of radiosondes 3. Diurnal temperature change in lower stratosphere äisälä radiosonde.**—*M.R.*

## SOIL TEMPERATURE

7.10–189 551.525:551.524

Dobosi, Zoltán, **A talajfelszín hőháztartása és annak mérése.** [Thermal balance of the surface and its measurement.] *Idojárás*, Budapest, 59(5):292–298, Sept./Oct. **1955.** gs., 7 refs., 12 eqs. Russian and German summaries p. 292. **DLC**—The factors involved he heat balance of the soil surface and their relation to the vertical temperature and humid- gradients of the atmospheric layers near the ground are discussed. Two methods of heat nce measurement are reviewed: 1) ALBRECHT's method and 2) a method based on BUDYKO's ange formula. The latter method eliminates measurement of the soil conductivity factor hence becomes applicable to the investigation of cultivated soil, or surfaces under plant er. *Subject Headings:* **1. Soil-air heat exchange 2. Heat balance measurement 3. Soil t conductivity.**—*Transl. of author's abstract.*

7.10–190 551.525.5

Crawford, Carl B., **Frost penetration studies in Canada as an aid to construction.** *National Research Council of Canada. Div. of Building Research, Technical Paper*, No. 20 [5 p.] gs., 22 refs. Reprinted from *Roads and Engineering Construction*, 93(2), Feb. **1955. DWB** elation of frost penetration to air temperature, snow cover, soil type, etc. are discussed and ves presented to show seasonal variations in frost penetration from year to year (at Winni- 1929–34), and in soil temperature at various depths (at Edinburgh). Freezing index vs. ree days at Ottawa, cumulative freezing indices at Ottawa (1947–54) in test pits, and for nada as a whole (1945–50) are also shown in graphs and charts. Research from the earliest es (FORBES, 1846) to the most recent Division of Building Research studies in Arctic and arctic Canada are discussed. *Subject Headings:* **1. Soil temperatures 2. Frost penetration anada.**—*M.R.*

7.10–191 551.525.5:551.579.5

†Kretschmer, G., **Das Verhalten gefrierenden Bodenwassers im Acker.** [The behavior reezing ground water in the soil.] *Angewandte Meteorologie*, Berlin, 2(7):193–211, April 6. 5 figs., 7 tables, 32 refs. German, English and Russian summaries p. 209–211. **DLC**— en soil freezes it expands because of the increase of volume of ice over water and also some- es because of the thrust of the ice crystals. Layers of ice are formed by the aggregation of stals. Ice crystals grow by sucking water from the surrounding soil; the freezing point ends on the tension which this introduces. The higher the speed of replacement of water, faster the growth of ice layers; slow percolation or quick freezing produces only single stals. A layer of ice forms at the frost limit, and ice films form at irregularities in the soil cture. In hard soils polyhedra are formed, breaking down into a crumbly state. A ence" of ice formation in soil is developed. *Subject Heading:* **1. Freezing soil.**—*C.E.P.B.*

### WATER TEMPERATURE

*See:* **Atmospheric wall** (Jansa Guardiola), 7.10–144; **Heat exchange between ocea and continents** (Pokrovskaia, Rubinshteĭn), 7.10–178; **Paleotemp. of Pacific botto waters** (Bandy), 7.10–268.

## PRESSURE AND WIND

### PRESSURE

*See also:* **Single heading flight** (U. S. Off. Res. & Inventions), 7.10–15; **Ocean wave propagation** (Crease), 7.10–40; **500-mb. temp. and 500–300 mb. thicknesses** (Berggren) 7.10–186; **Deficiencies in geostrophic approximation** (Hollmann), 7.10–198.

7.10–192 551.541:523.593:5

Abdullah, Abdul Jabbar (*Dept. Met. & Oceanog., N. Y. Univ.*), **The atmospheric s wave.** *American Meteorological Society, Bulletin,* 36(10):511–518, Dec. **1955.** 7 fi refs., 6 eqs. **DWB**—Some of the literature on the formation and hydrodynamic proper solitary waves observed in shallow water is reviewed and evidence for the occurrence solitary wave in the atmosphere is presented. The mechanism of formation of a s wave under laboratory conditions is described and is extended to atmospheric condi The theory of the breaking type and of the permanent type solitary wave is presente synoptic situation favorable to the formation of atmospheric solitary waves and the form of a nearly permanent wave are described and the possible effect of solitary waves, whic inundate mountains, upon local weather is discussed. *Subject Headings:* **1. Solitary theory 2. Atmospheric waves.**—*I.L.D.*

7.10–193 551.541:55

Tepper, Morris and Newstein, Herman, **On the impulsive addition of momentu simple current systems by asymmetrical velocity profiles.** *Journal of Meteorology,* 13(3) 315, June **1956.** 2 figs., ref. **DWB**—Supplement to paper (same title, *J. of Met.,* 12:287 1955; *see* 6.11–243, Nov. 1955, *MAB*) giving additional computations with an elect computer, showing 3 ways in which momentum is added to the current. *Subject Hea* **1. Pressure jump theory.**—*C.E.P.B.*

7.10–194 55

Barbanti-Silva, L. and Depietri, C., **Aspetti statistici dell'andamento della press atmosferica a Modena.** [Statistical aspects of atmospheric pressure conditions at Mod *Modena. Università. Osservatorio Geofisico, Pubblicazione,* No. 61, **1955.** 18 p. 5 6 tables, 10 refs. **DWB.** Reprinted from *Accademia di Scienze, Lettere e Arti de Mo Atti e Memorie,* Ser. 5, Vol. 13, **1955.**—Mean annual seasonal and monthly pressure at Mo is calculated and compared in tables and graphs for periods 1864–1881, 1899–1928, 1929– and 1899–1948. Daily values for 1899–1948 are also tabulated and averages for dec (10-day) given. These values are used to show graphically the difference in the annual c curve when calculated for the different periods given above. The variability in mean d pressure in any given month is shown in 12 graphs and the annual variation in daily va (1929–48) in another. It can be seen that the greatest variability occurs in winter and least in summer. Standard deviations from month to month are shown. *Subject Headi* **1. Pressure variations 2. Pressure normals 3. Modena, Italy.**—*M.R.*

7.10–195 551.543:551.5

Faust, Heinrich, **Der Durchgriff hoher Druckänderungen als Funktion des vertik Temperaturgradienten.** [High pressure changes as a function of the vertical tempera gradient.] *Meteorologische Rundschau,* Berlin, 9(5/6):78–79, May/June **1956.** 4 figs., **DLC**—Pressure changes caused by divergence or convergence require vertical motion in surrounding layers. Hence the more stable the air the greater the part played by horizo flow. HINKELMANN's 3 cases are examined statistically by plotting isolines of tempera

erence 850–500 mb on a grid of 24 hr change of 225 mb level and 24 hr change of surface ssure (837 cases). This shows that on the whole rising (falling) pressure at the surface lts dynamically from rising (falling) 225 mb level. With stable air, pressure rises (falls) ng to advection of cold (warm) air aloft. *Subject Headings:* **1. Pressure changes 2. Upper emperature changes.**—*C.E.P.B.*

7.10–196 551.543:621.3 551.524.3:621.3

Reiter, Reinhold, **Beziehung zwischen Häufigkeit von Infra-Langwellen (10–50 kHz) grossräumigen Druck- sowie Temperaturänderungen über Mitteleuropa.** [Relation veen frequency of infra-long waves and extensive pressure and temperature changes over ral Europe.] *Zeitschrift für Meteorologie*, Berlin, 9(11/12):369–372, Nov./Dec. **1955.** gs., 8 refs. **DWB**—Frequency of long-wave impulses is compared with 24 hr changes of ace pressure and of relative topography 500/1000 mb. over Europe, for 20 groups of days. ressure is rising to W or NW and/or 1000/500 mb. thickness is decreasing, impulses increase. all of pressure to N or NW and/or increase of thickness brings a decrease of impulses. g waves can therefore be used as indicators of large-scale synoptic changes. *Subject dings:* **1. Long wave radio disturbances 2. Pressure change effects 3. Upper air tem- ature change effects.**—*C.E.P.B.*

## WIND

*See also:* **Small scale turbulence studies** (Miller, others), 7.10–12.

7.10–197 551.55:531

Hilder, Brett, **A note on the relative wind.** *Institute of Navigation, London, Journal*, :237–239, April **1956.** 5 figs. **DWB**—An account is given of the discovery in 1728 of tive motion. The application of observations of smoke from ships to air navigation over sea is explained. *Subject Heading:* **1. Relative wind.**—*C.E.P.B.*

7.10–198 551.55:551.542.1:551.509.312

Hollmann, G., **Über prinzipielle Mängel der geostrophischen Approximation und die führung ageostrophischer Windkomponenten.** [The principal deficiencies in the geo- phic approximation and the introduction of ageostrophic wind components.] *Meteoro- sche Rundschau*, Berlin, 9(5/6):73–78, May/June **1956.** 11 refs., 59 eqs. **DLC**—This hematical paper examines some of the fundamentals of numerical forecasting. If too y approximations are made in the geostrophic and vorticity terms, considerable errors of potential tendency may be introduced. Questions of hydrostatic stability and vertical ion during a change of enthalpy are considered. "It follows that in order not to obtain sult in conflict with the energy principle, the application of the geostrophic approximation t ignore horizontal differences of hydrostatic stability." Finally, attempts to build non- strophic theories with only a partial regard for ageostrophic wind components are critically sidered. *Subject Headings:* **1. Geostrophic approximation 2. Numerical forecasting.** *.E.P.B.*

## TURBULENCE

*See also:* **Smoke diffusion in stratosphere** (Kellogg), 7.10–120; **Energy dissipation and spectrum in turbulent jet** (Chiu, Rib), 7.10–140; **Power spectrum analysis** (Griffith, others), 7.10–179.

7.10–199 551.551:551.515.4:551.509.5

Bates, Ferdinand C. (*U. S. W. B., Kansas City, Mo.*), **A technique for predicting extreme ulence related to thunderstorms.** *American Meteorological Society, Bulletin*, 36(8):379– , Oct. **1955.** 3 figs., 6 refs., eqs. **DWB**—A procedure for the prediction of extreme tur- nce within and in the vicinity of thunderstorms is proposed and developed. The objective he technique, within the limits of accuracy attainable, is the prediction of turbulence racterized by effective gusts of a given magnitude. The technique is basically similar to ent techniques in the use of indices to potential energy of hydrostatic instability. Since

the technique is developed upon a physical basis with statistical links, there exists a po of further refinement through a consideration by parts when further necessary ba become available. *Subject Headings:* **1. Thunderstorm turbulence 2. Turbulence fore** —*Author's abstract.*

7.10–200 551.5

Gifford, Frank, Jr., **The relation between space and time correlations in the atmo** *Journal of Meteorology*, 13(3):289–294, June **1956.** 4 figs., 13 refs., 26 eqs. **DW** servations of turbulence in terms of time at a fixed point, and theory in terms of space tions at a fixed time, are compared for an intermediate level of turbulence. Energy at 300 ft on Brookhaven tower and simultaneous airplane data at the same height, are to agree. Some applications of the theory to observations are discussed. *Subject He* **1. Turbulence theory 2. Brookhaven, N. Y.**—*C.E.P.B.*

7.10–201 551.551:51

†Webb, E. K., **Autocorrelations and energy spectra of atmospheric turbulence.** *A Commonwealth Scientific and Industrial Research Organization. Div. of Meteorological P Technical Paper*, No. 5, **1955.** 28 p. 15 figs., 4 tables, 25 refs., 28 eqs. **DWB**—Autoc tions are presented for temperature, specific humidity, and downwind ($u$) and vertic velocity components at 1.92 and 29 m above ground under a wide range of stabilit wind speed of about 5 m/sec. These and the derived energy spectrum functions for $u$ are discussed and related to results of earlier work. The spread of the correlogram g measure of scale time, which corresponds to the peak in the associated energy spectrun when multiplied by wind speed, of scale length. The scale length is much smaller for $u$ for the other elements in inversion conditions, and remains smaller in lapse conditions u height of about 29 m where they become approximately equal. In general the spe functions are dominated by a major peak towards the low frequency end, though in conditions there is an appreciable fraction of the energy spread among higher frequencie in most cases a second major peak. The equivalent horizontal scale of the first peak inc with (negative) Richardson numbers in moderate lapse conditions and is greater for $u$ for $w$; there is some indication that these relations are reversed at large (negative) Richa numbers. Four appendices deal with computational and other mathematical aspec autocorrelation and spectrum analysis. *Subject Headings:* **1. Autocorrelations 2. Atmosp turbulence 3. Turbulence spectrum.**—*Author's abstract.*

## WIND VARIATIONS AND SPECIAL WINDS

*See also:* **Power spectrum analysis** (Griffith), 7.10–179; **Buoyancy and precip. in tropical clouds** (Ackerman), 7.10–227.

7.10–202 551.5

Czelnai, L. Rudolf, **A Balaton partmenti cirkulációs rendszerének néhány sajátos** [A few peculiarities of the circulation over the shore-line of Lake Balaton.] *Időjárás*, B pest, 59(4):224–229, July/Aug. **1955.** 6 figs., 3 refs. Russian and German summaries p. **DWB, DLC**—Periodic local winds on the shores of Lake Balaton are analyzed from re obtained at Siófok, Balatonkenese and Keszthely. Only anticyclonic, calm and clear wea situations were considered in this study. Amplitudes and periodicities of wind dire and velocity variations in the local circulation system are in general agreement with theore calculations of DEFANT. *Subject Headings:* **1. Land and sea breezes 2. Lake Bal Hungary.**—*Trans. of author's abstract.*

7.10–203 551.553.11

Sajnani, P. P. (*Meteorological Office, Ahmedabad*), **Sea-breeze at Ahmedabad.** *I Journal of Meteorology and Geophysics*, Delhi, 7(1):49–54, Jan. **1956.** 3 figs., 4 tables **DWB, DLC**—It is found that summer months at Ahmedabad are marked by the arrival o breeze from the Gulf of Cambay (about 50 mi to the south) during the evening hours.

currence of sea-breeze is more frequent and its effect more pronounced in the months of ay and June. A few statistical data relating to this sea-breeze are given in this paper. *bject Headings:* **1. Sea breezes 2. Ahmedabad, India.**—*Author's abstract.*

7.10–204 551.553.8(595)

Shorney, P. W., **Storm at Tengah, December 21, 1955.** *Meteorological Magazine*, London, (1008):182–183, June **1956. DWB**—In a squall at Tengah, Malaya, lasting almost 1 min, face wind rose suddenly to 40 kn, 1.4 mm of rain fell in 30–40 sec., pressure fell 1 mb in- ntly, temperature fell 5°F and humidity rose 30%. Clouds and upper winds are described. e squall crossed the airfield at 30 kn. *Subject Headings:* **1. Squalls 2. Tengah, Malaya.** *C.E.P.B.*

7.10–205 551.555.8(47) 551.510.42:551.577

Astapovich, I. S., **Pyl'naia buria nad tsentral'nym Kopet-Dagom.** [Dust storm over ıtral Kopet-Dag.] *Priroda*, Moscow, 44(7):98–99, July **1955.** fig. **DLC**—The con- :utive phases of development of a dust storm which raged on March 13, 1953 over the ɔuntain of Kopet-Dag in the Turkmen SSR, observed by the author from the platform of hkhabad Astro-Physical Observatory, are described in detail and discussed. The storm ıs terminated by a rain, the drops of which contained tens of thousands of tiny quartz par- les. The author assumes that the phenomenon was caused by a wind storm which occurred North Iran and raised large quantities of dry loess dust into the air and transported them er the Kopet-Dag ridge into the desert of Kara-Kumy. There were no less than 100 thou- nd tons of dust in the air. The author points out that in Italy intrusions of brick red dust, ming from Africa over the Mediterranean are observed mainly in March. In certain cases ch phenomena are ascribed to precipitation of cosmic dust. *Subject Headings:* **1. Dust ɔrms 2. Dust content of rain 3. Kopet-Dag, Turkmen SSR.**—*A.M.P.*

## WIND EFFECTS

*See also:* **Ocean wave propagation** (Crease), 7.10–40; **Precip. measurements** (Kurtyka), 7.10–87; special bibliography on **Hurricane and Storm Surge Damage**, p. 1270.

7.10–206 551.556:551.463

Abe, Tomaosaburo (*Oceanographic Lab., Met. Inst., Japan*), **A study on the foaming of sea ıter.** *I.U.G.G. Association of Physical Oceanography, Rome, Sept. 14–25, 1954, Procès- erbaux*, Bergen, **1954.** p. 260–261. eq. **DWB**—The procedure followed in one of the few udies on the foaming of sea water and of solutions of various inorganic electrolytes at varying mperatures and concentrations is described and the results obtained are summarized in rms of chemical relationships to height or decay of the foam layer. (*See also* 6.11–61, Nov. '55 and 7.9–49, Sept. 1956, *MAB.*) *Subject Heading:* **1. Foam layer of sea water.**—*A.M.P.*

7.10–207 551.556:551.465(261)

Lawford, A. L., **The effect of wind upon the surface drift in the north-eastern Atlantic ıd the North Sea.** *Weather*, 11(5):155–161, May **1956.** 4 figs. **DWB**—In 1954 drops of )00 plastic envelopes containing addressed cards were made from airplanes between the ıeroes and Bay of Biscay. Of those on May 5–7, Aug. 31–Sept. 1 and Dec. 15–17, 30-42% cards were returned. Maps show mean direction and spread of envelopes from each section, ıd winds at Weather Ships and in English Channel and North Sea. Results show the strong fluence of winds on currents. *Subject Headings:* **1. Wind driven currents 2. North Atlantic.** *-C.E.P.B.*

7.10–208 551.556:595.78

Seilkopf, H., **Insekten auf See—in meteorologischer Sicht. Monarchen über dem zean—Admirale fehlten.** [Insects at sea: meteorological aspects. Monarch over the ocean, dmirals absent.] *Wetterlotse*, Hamburg, No. 98:51–56, March **1956.** 4 figs. **DLC**—The merican butterfly Monarch (*Danais plexippus*) has been reported in the British Isles over

200 times in 80 yrs. The occasions as given by C. B. WILLIAMS are plotted since 1876, s... maxima in 1885–6 and especially around 1933. The curve is rather similar to that of hu... frequency, and the invasions were probably due to strong W winds. An example w... transport of NW African insects to the Shetlands on Aug. 2, 1952. Opposite con... (high cold trough) prevailed in summer and autumn 1955, when there were no southe... migrants such as the Red Admiral. *Subject Headings:* **1. Insect migrations 2. Wind e...** —*C.E.P.B.*

## UPPER AIR WINDS

*See also:* **High-level navigation** (Bannon et al.), 7.10–49; **Navigation over N. Atlantic** (Willis), 7.10–51; **Aerological observations** (Serra), 7.10–76; **Upper wind forecasting** (Johnson), 7.10–109; **Correlation of fading signals** (Barber), 7.10–131; **Ionospheric drift** (Yerg), 7.10–139; **Easterly jet stream** (Alaka), 7.10–152; **Jet stream** (Boville et al.), 7.10–153; **Jet stream exploration by aircraft** (Saucier, Riehl), 7.10–155.

7.10–209 551.557:551.5...

Berg, Hellmut (*Dir., Met. Inst., Köln Univ.*), **La determinazione dei venti nella iono...** [The determination of winds in the ionosphere.] *Geofisica e Meteorologia*, Genoa, 3(3):3... May/June **1955.** eq. **DWB**—The procedure for determining the presence of winds i... ionosphere by measuring the velocity of translation of configuration of electronic densiti... the method of reflection of impulses is described and it is shown that it does not provide p... information on the effective velocity of the configuration of electronic "clouds" or on... vector representing the movement of ionospheric perturbations. The method of "... vectors" for measuring exactly ionospheric wind velocities is described. *Subject Hea...* **1. Ionospheric wind measurement.**—*I.L.D.*

7.10–210 551.557:621.396.8:523.7(...

Palmer, C. E., **Solar radio noise and high-level zonal wind shear over the central Pa... Ocean.** *Journal of Meteorology*, 13(3):315–316, June **1956.** fig., 3 refs. **DWB**—A run... plot of zonal wind shear at 30,000 ft between Wake Island and Eniwetok Atoll shows... cyclonic shear reaches a maximum 8 days after a solar flare and anticyclonic shear 8 days a... a quiet day. The index of solar activity is solar radio noise. *Subject Headings:* **1. Zonal w... shear 2. Solar radio noise 3. Pacific Ocean.**—*C.E.P.B.*

## VERTICAL MOTION

*See also:* **Thermal upward flow in ionosphere** (Akasofu), 7.10–130.

7.10–211 551.558:797.55(9...

Wills, Philip, **Upcurrents in the Mackenzie country.** *Weather*, 11(4):101–103, April **19...** fig., plate, ref. **DWB**—The Mackenzie basin is an oval plain 60×45 mi, 2000 ft a.s.l. to... of Mt. Cook. Gliding in thermals and standing waves is described; wave length was 2... more than 6 mi high. The Mt. Cook wave system seems better than the Bishop wave... California. *Subject Headings:* **1. Updrafts 2. Gliding 3. New Zealand.**—*C.E.P.B.*

7.10–212 551.558.2:551.57...

Scorer, R. S., **An unusually smooth wave pattern in a condensation trail.** *Meteorolog... Magazine*, London, 85(1008):182, June **1956.** **DWB**—SCORER states that W. G. HARP... (same title), *Met. Mag.*, 85(1004):38–43, Feb. **1956** (*see* 7.7–186, July 1956, *MAB*), does... correctly apply the conditions for lee waves and the perturbation theory. HARPER agre... *Subject Headings:* **1. Standing waves. I. Harper, W. G.**—*C.E.P.B.*

7.10–213 551.558

Queney, Paul (*Univ. of Paris, France*), **Rotor phenomena in the lee of mountains.** *Tel...* Stockholm, 7(3):367–371, Aug. **1955.** fig., 15 eqs. **DLC**—The breaking up of stationary... waves produced by big mountains into turbulent longitudinal whirls or "rotors" is analyze... a particular case of the general "problem of the change of a wave motion into a syste...

tices in the vicinity of a level where the basic flow has the same activity as the waves;" s change is termed the "cat's eye effect." The author presents the theory of "cat's eye ct" and its application to rotors and to stationary vortices and wave-like clouds observed und a level where the wind changes sign. *Subject Headings:* **1. Lee eddies 2. Cat's eye ect.**—*I.L.D.*

# AQUEOUS VAPOR, HYDROMETEORS AND HYDROMETEOROLOGY

## HUMIDITY

7.10-214 551.571:551.509.59

*Dodd, Arthur V., **High humidities at high temperature.** *U. S. Quartermaster Corps. search and Development Command. Environmental Research Div., Technical Report, EP-9,* ıy **1955.** 23 p. 4 tables, 12 figs., 8 refs. **DWB**—Using simultaneous dew point and nperature records for stations on the Persian Gulf (Abadan, Bahrein Islands, Dharan) l El Centro, Calif., the author attempts to estimate the maximum likely atmospheric midity at temperatures above 80°F. The relationships between mean temperatures and v points, wet bulb temperatures, and the temperature-dew point distribution are analyzed. equency distribution charts for temperature versus dew point temperatures for various local ndard time subdivisions are presented. *Subject Headings:* **1. Dew point temperatures Humidity forecasting 3. Temperature-dewpoint distribution 4. Persian Gulf 5. El ntro, Calif.**—*I.L.D.*

7.10–215 551.571.3:632.9(42)

Smith, L. P., **This map shows infection days.** *Grower*, London, 44:1505–1506, Dec. 24, 55. fig. **DA**—Spread of some plant diseases depends on length of time leaves are wet. a measure of this, a map is given of average number of days, June–Sept. 1950–54, with at lst 12 hrs of humidity >90%. *Subject Headings:* **1. Humidity extremes 2. Plant diseases England 4. Wales.**—*C.E.P.B.*

7.10–216 551.571.4:551.515.8

Pothecary, I. J. W., **Comments on "A study of a characteristic type of upper-level fronto- nesis."** *Journal of Meteorology*, 13(3):316–317, June **1956.** 3 refs. **DWB**—Referring to per by R. J. Reed (*J. of Met.*, 12(3):226–237, June **1955,** *see* 6.9–170, Sept. 1955, *MAB*) cribes British observations which confirm subsidence of dry air in or near frontal zones. *bject Headings:* **1. Humidity profiles 2. Frontal passage effects.**—*C.E.P.B.*

## EVAPORATION AND EVAPOTRANSPIRATION

*See also:* **Climate and irrigation** (Blaney), 7.10–250.

7.10–217 551.573

Blaney, Harry F. and Muckel, Dean C. (*both, Soil and Conservation Branch, U. S. Dept. Agriculture, Los Angeles*), **Evaporation and evapotranspiration investigations in the San ncisco Bay Area.** *American Geophysical Union, Transactions*, 36(5):813–820, Oct. **1955.** , 9 tables, 7 refs. **DWB, DLC**—During 1953 and 1954 studies were made to determine bable evaporation and evapotranspiration losses that would occur if barriers were con- ucted across the San Francisco Bay to exclude salt water. This would create fresh-water ls to conserve water for irrigation, domestic and industrial use. Available measurements of poration and consumptive use of water by vegetation were compiled and analyzed. New natological stations were established in areas not covered by existing stations and measure- nts made on evaporation, temperature, humidity, wind movement and precipitation. aporation and consumptive use data were correlated with climatological records and imates were made of annual and monthly rates of evaporation from lake surfaces and nsumptive use by marsh vegetation for the 1921–1952 period and for the five critical years,

1923, 1924, 1930, 1931 and 1951. *Subject Headings:* **1. Evapotranspiration losses 2. E tion from lakes 3. San Francisco, Calif.**—*Authors' abstract.*

7.10–218 551.573

Georgii, Hans Walter, **Einige Versuche zur experimentellen Bestimmung der Ve fungsgeschwindigkeit kleiner Tröpchen.** [Some tests of experimental determina evaporation velocity of small droplets.] *Zeitschrift für Aerosol-Forschung und T* Stuttgart, 3(5/6):496–502, Dec. **1954.** 3 figs., 11 refs. Abstracted from reprint. oratory investigation of the rate of fog droplet evaporation to get a better idea of t played by evaporation (beside sedimentation, coagulation and diffusion of fog) in th centration decrease of fogs is presented. The results of measurements (under micr in a tightly closed room, in still air and by constant temperature and water vapor (50%) of the air of the shrinkage of glycol droplets (3.5, 32 and 38$\mu$ large) are prese graphs showing that the shrinking rate proceeds according to LANGMUIR's law (5.1 droplet radius). The behavior of droplets sprayed with glycol on magnesium oxide a is different in spite of identical initial concentration and size of aerosol particles—gly droplets disintegrate completely in 25 min, while magnesium oxide fog still has 60% initial concentration at this moment. This is explained by evaporation of glycol fog does not take place in MgO fog where the concentration decrease is only due to sediment coagulation and diffusion of the aerosol particles. These results are graphically pre and show the part played by evaporation in the concentration decrease of glycol and fogs which agree with results of measurements made by H. KEMY, A. WINKEL and G. YA *Subject Headings:* **1. Evaporation of fog droplets 2. Fog dissipation.**—*A.M.P.*

## CONDENSATION

*See also:* **Glazed frost** (Brooks), 7.10–7; **Dew measurement** (Gelbke), 7.10–10; **Aitken nuclei counter** (Ohta), 7.10–90.

7.10–219 551.574.1:536.421:546.212:534.

Alpert, Leo, **Crystallization of supercooled water by ultrasonic irradiation.** *Journ Meteorology*, 13(3):317–318, June **1956.** 6 refs. **DWB**—Calls attention to work by TURNER and A. VANHOOK on crystallization by ultrasonic radiation (8–16 kc) of dis water supercooled by 1–2°C. Some instances of crystallization of fog or cloud given by R. and M. SCHWOB are also quoted. *Subject Headings:* **1. Freezing of water 2. Ultra vibrations. I. Turner, C. F. II. VanHook, A. III. Ives, R. IV. Schwob, M.**—*C.E.P.B*

7.10–220 551.574.1:551.52

Atkinson, J. R. (*Univ. of Glasgow, Scotland*), **Uncharged condensation nuclei prod by ultra-violet light.** *Geofisica Pura e Applicata*, Milan, 31:54–59, May/Aug. **1955.** 5 3 refs. **DWB, DLC**—A large number of experiments have been carried out with the ob of determining the nature, properties and source of the condensation nuclei produced by action of a beam of ultraviolet light within an expansion chamber. This paper is essent a qualitative summary of the results which have been obtained. It is concluded that t experiments show that it is the rubber component of the chambers that has been respon for the major part of the effect. It is by no means suggested that this is the only sour the nuclei, but it is implied that only apparatus free from rubber should be used in any s of the properties of the nuclei associated with a given gas or vapor. *Subject Headings:* **1. charged nuclei 2. Ultraviolet light effects on nuclei.**—*Author's abstract.*

7.10–221 551.5

Fürth, R. (*Birkbeck College, Univ. of London*), **On the theory of diffusion and sedimenta of condensation nuclei in cylindrical containers.** *Geofisica Pura e Applicata*, Milan, 31:8 May/Aug. **1955.** 2 figs., 4 tables, 6 refs., 40 eqs. German and English summaries p **DWB, DLC**—The theory is given of a method for determining the diffusion coefficient $D$ the sedimentation velocity $V$ of a suspension of uniform nuclei in a stationary gas conta

cylindrical vessel with vertical axis and absorbing walls. It is shown how $D$ and $V$ be calculated from measurements of the total number $N$ of particles in the container ne relative loss per unit time $\Lambda = -\frac{1}{N}\frac{dN}{dt}$ of this number for two different time intervals. n $D$ and $V$ the size, density and mass of the nuclei can be deduced. *Subject Headings:* **uclei diffusion 2. Nuclei size 3. Nuclei mass 4. Nuclei density.**—*Author's abstract.*

7.10–222 551.574.1:551.594.12

Holl, W. and Mühleisen, R. (*Max-Planck Inst., Weissenau, Germany*), **On the equilibrium onisation in air containing nuclei.** *Geofisica Pura e Applicata*, Milan, 31:115–118, May/ . **1955.** 5 figs., 7 refs., 8 eqs. German summary p. 115. **DWB, DLC**—In the atmosphere he outskirts of large cities the concentration of condensation nuclei and of the positive and ative small ions were measured simultaneously. It was possible to represent their con- ion by the formula; $n \cdot M^{1\,2.3} = \text{const}$. An interpretation of this formula from the behavior ne condensation nuclei was attempted. *Subject Headings:* **1. Ion balance 2. Condensation lei.**—*Authors' abstract.*

7.10–223 551.574.1

Nolan, P. J. and Kuffel, E. (*Univ. College, Dublin*), **Production of nuclei from ammonia nitric acid.** *Geofisica Pura e Applicata*, Milan, 31:50–53, May/Aug. **1955.** fig., table, fs. English and German summaries p. 50. **DWB, DLC**—The size and charge distribution uclei obtained by passing air over ammonia and nitric acid are examined. In agreement McHenry it was found that the average radius is less than $1.0 \times 10^{-6}$ cm. The hetero- eity of the nuclei is discussed. *Subject Headings:* **1. Ammonium nuclei 2. Artificial nuclei luction.**—*Authors' abstract.*

7.10–224 551.574.1

O'Connor, T. C. (*Dublin Inst. for Advanced Studies*), **Some characteristics of condensation lei stored in a large vessel.** *Geofisica Pura e Applicata*, Milan, 31:107–114, May/Aug. 5. fig., 4 tables, 9 refs., eq. English and German summaries p. 107. Discussion p. 114. **B, DLC**—The coagulation coefficient, size and charge distribution of condensation nuclei n room air when stored in a 4000 litre rubber balloon gasometer were studied. The results cate that the acquisition of water vapor contributes to the growth of stored nuclei. A iminary trial was made to see if Junge's approximate rule that the number of particles in aerosol varies inversely as the third power of their radius, also holds for *Aitken* nuclei. ther confirmation of the relationship between the percentage of stored nuclei electrically rged and their average radius was obtained. The measurements were carried out by means he Pollak-Murphy improved version of the photoelectric nucleus counter. A statistical lysis based on over a thousand comparisons of two identical models shows that the agree- nt of *individual* readings is better than 10% of nucleus concentration in 80% of all cases. essive differences have now been eliminated. *Subject Headings:* **1. Nuclei size 2. Charged lei 3. Photoelectric nuclei counters.**—*Author's abstract.*

## FOG

*See also:* **Evaporation velocity of droplets** (Georgii), 7.10–218.

7.10–225 551.575

Watanabe, K., **On the area of sea fog coverage over Yufutsu Plain.** *Journal of Meteorological Research*, Tokyo, 5(1):67–69, March **1953.** 4 figs. **DWB**—Sea fog was observed ually and air temperature measured with the following results: 1) the most frequent thick- s of fog layer is between 100 and 300 m, 2) the farther a station is located from the coast the ner fog dissipates in the morning, 3) temperature difference between seaside and inland tions at 10 a.m. is 2 to 3°C on fog-free days and 6 to 8°C on foggy days. *Subject Headings:* **Sea fog 2. Fog dissipation 3. Temperature variations 4. Yufutsu Plain, Japan.**—*From hor's abstract.*

## CLOUDS

*See also:* **Sunshine-cloudiness relationships** (Mörikofer, Nagel) 7.10–167; **Condensation trail** (Scorer), 7.10–212.

7.10–226 551.576.1

Bleeker, Wouter, **Cloud atlas.** *World Meteorological Organization, WMO Bu* 4(4):135–138, Oct. **1955.** photo. **DWB**—The working group of CSM charged with re and bringing up to date the 1939 cloud atlas which was out of print, met 6 times in the 8 1947–1955 (once at Washington, once at Brussels and 4 times in Paris). The job was pleted, thanks to a French permanent editing committee, and a French and English ve produced, with a completely rewritten text. From thousands of photographs (hundre color, 130 black and white), 117 colored photographs were selected. Improvements in addition of species and varieties; *accidental details* are given some emphasis, and the id the *mother cloud* introduced. Meteors of all types, rather than just hydrometeors, described and a journal form included for those wishing to keep cloud or hydrometeor rec *Subject Headings:* **1. Cloud atlases 2. International Cloud Atlas.**—*M.R.*

7.10–227 551.576.11:551.555.1:551.577.11 551.509.67(7

Ackerman, Bernice, **Buoyancy and precipitation in tropical cumuli.** *Journal of Me ology,* 13(3):302–310, June **1956.** 11 figs., 4 tables, 9 refs. **DWB**—Observations were m by airplane in trade-wind cumuli around Puerto Rico of radar echoes of precipitation virtual temperature. Buoyancy was calculated from excess of cloud temperature over vironment. Temperature in clouds varied on scales of 1000 and 100–200 ft. Subseq echo history showed that precipitation depended on excess of temperature, environme humidity and wind shear. Scatter diagrams of echo *vs* no echo explain 87% of occurrence rain. Formation of rain in upper parts of cloud was accompanied by a decrease in cl buoyancy. Individual cases are examined. Some clouds were sprayed with water; he (but not light) spraying increased probability of precipitation when buoyancy was not fa able for natural precipitation. *Subject Headings:* **1. Precipitation from tropical cun 2. Cloud spraying 3. Trade wind cumulus clouds 4. Puerto Rico.**—*C.E.P.B.*

7.10–228 551.576.2:551.50

*Latimer, R. J., **Cloudiness in Canterbury in southerly conditions.** *New Zealand. teorological Service, Technical Note,* No. 118, Nov. 2, **1954.** 7 p. fig., mostly tables. **DWB** An analysis of 1800 GMT charts for 1951 and 1952 as prepared at the General Forecast Offi Wellington, wherein precipitation and cloudiness frequencies for air flow from southe directions, as represented by orientation of isobars between ESE and WSW (6 types), tabulated for 9 stations and presented in eleborate frequency tables. Sheltering effects ranges are clearly demonstrated: the more westerly the isobar, the greater the area protect Short term changes in weather distribution can be forecast by reference to pressure tendenci as these affect the isobar orientation, and are valid for forecasts of 24–36 hrs. *Subject Headin* **1. Cloud forecasting 2. Synoptic climatology 3. Air flow types 4. Canterbury Distri New Zealand.**—*M.R.*

7.10–229 551.576.3:551.51

Kimachi, T., **Some aspects on the middle cloud layer.** *Journal of Meteorological Resear* Tokyo, 7(5):290–294, July **1955.** 5 figs., table. In Japanese; English summary p. 2 **DWB**—The present paper deals essentially with the description and division of some charact istic features of frontal middle cloud layer mainly with the altostratus, i.e., the division of t top and the base of the frontal middle cloud, from the data of radio soundings and raw at Yonago from 1950–1952. We obtained the model of the medium cloud layer, which consi of two layers with different values of lapse rate, and there seems to be subsidence at the t Furthermore, from the analysis of potential temperature ($\theta$) and equivalent-potential te perature ($\theta e$) at the top and base of cloud layer, it is concluded that, far distant (about 800 k from a cyclone center, $\theta e$ at the base of middle cloud layer is nearly equal to $\theta$ at the top of and in general the lapse rate in the cloud layer is smaller than the wet-adiabatic lapse ra

, in proportion to the approach to a cyclone center this difference becomes smaller. *ct Headings:* **1. Frontal cloud layers 2. Altostratus 3. Cloud models.**—*Author's abstract.*

## PRECIPITATION

*See also:* **Radio emission from Jupiter** (Ovenden), 7.10-17; **Glaciological investigations of U.S.S.R.** (Avsiuk), 7.10-21; **Rainfall and wheat germination** (Mallik), 7.10-55; **Crop growth and rain** (Owen, Watson), 7.10-56; **Rainfall in different woodlands** (Ovington), 7.10-59; **Chemical composition of precip.** (Rossby), 7.10-116; **Dust storm** (Astapovich), 7.10-205; **Buoyancy and precip. in tropical clouds** (Ackerman), 7.10-227; special bibliography on **Hurricane and Storm Surge Damage,** p. 1270.

7.10-230 551.577

Jordan, Charles L. (*Headquarters, Air Weather Service, Wash., D. C.*), **Some features ıe rainfall at Guam.** *American Meteorological Society, Bulletin,* 36(9):446-455, Nov. . 10 figs., 10 tables, 10 refs. Also issued as: Chicago. Univ. Dept. of Meteorology, ract N6ori-02036, [unnumbered] Technical Report, Feb. 1955. 10 figs., 10 tables, 10 **DWB**—Fairly detailed rainfall data, taken mainly during one year, form the basis for ıamination of the character of the dry- and wet-season rainfall at Guam. Distribution s of the rainfall show the importance of the topography and the relation of the rainfall rns to the direction and persistence of the low-level flow. Time curves of the mean all of the island illustrate the large day-to-day variability and point to the importance noptic disturbances. The frequency, duration and intensity of rain during the two sea- as well as diurnal variations in these quantities, are also examined. *Subject Headings:* **ainfall data analysis 2. Rainfall variability 3. Guam.**—*Author's abstract.*

7.10-231 551.577.2:551.501.6

Knoch, K., **Über Klimakarten grossen Massstabs.** [On large scale climatic charts.] *orologische Rundschau,* Berlin, 9(5/6):108-109, May/June 1956. 2 refs. **DLC**—The aration of H. SCHIRMER's chart of annual rainfall of Germany on a scale of 1-200,000 is ssed. *Subject Headings:* **1. Rainfall charts. I. Schirmer, H.**—*C.E.P.B.*

7.10-232 551.577.3:519.241.8(759):628.1

Baum, Werner A. and Asplund, Stanley E., **Climatological aspects of rainfall.** *Florida. . at Gainesville. Engineering and Industrial Experiment Station, Engineering Progress, Bulletin Series,* No. 72:22-31, April 1955. fig., 5 tables, 10 refs. **DLC**—Average 9-53), median, upper and lower decile values and other statistics, showing variability nual rainfall at a score of stations in Florida, are tabulated and discussed in relation to ıt on water supply. Seasonal and monthly variability is similarly analyzed for a dozen ons, and reliability of monthly rainfall for 4 stations. Finally, spatial variability in a l area is analyzed from data at 3 stations near Orlando for 1949-53. Local thunderstorms ide bulk of rainfall in June-Sept. *Subject Headings:* **1. Rainfall variability in Florida orida.**—*M.R.*

7.10-233 551.577.32:551.509.54:551.590.25

Bowen, E. G., **An unorthodox view of the weather.** *Nature,* London, 177(4520):1121-, June 16, 1956. 3 figs., 2 tables, 4 refs. **DWB**—Forecasting rainfall is imperfect because urements of freezing nuclei, though possible, are lacking. In 1954, 1955 and 1956 high ntrations were observed in various parts of the world about Jan. 13, 22 and 30, and on ame dates there were maxima in long period daily means of rainfall in British Isles, frica, U. S. and New Zealand. Peaks in mean daily rainfall Nov.-Jan. for 300 widely ibuted stations come about 30 days after a number of regular meteor streams. *Subject ings:* **1. Meteor influences 2. Precipitation variations.**—*C.E.P.B.*

7.10-234 551.577.32(94)

Hannan, E. J. (*Australian Natl. Univ., Canberra, A.C.T.*), **A test for singularities in ıey rainfall.** *Australian Journal of Physics,* Melbourne, 8(2):289-297, June 1955. 2

tables, 4 refs., 3+eqs. **DWB, DLC**—A statistical test of the homogeneity of daily m rainfalls (after the removal of a smooth seasonal trend) for Sydney over the years 1859 1952 does not contradict the hypothesis of homogeneity. The test was suggested by the the that meteoric dust produces rainfall singularities, proposed by BOWEN (1953). The tes made difficult by the complicated stochastic nature of the process generating the observatio so that the significance level may in fact be lower than presumed. As the test statistic d not fall in the critical region, however, there can be no doubt that the test does not contrad the hypothesis (of homogeneity of means) at the presumed significance level. *Subject He ings:* **1. Rainfall singularities 2. Homogeneity 3. Long period records 4. Sydney, Austral** —*Author's abstract.*

7.10–235 551.577.32:551.590.

Whipple, Fred L. and Hawkins, Gerald S., **On meteors and rainfall.** *Journal of Mete ology*, 13(3):236–240, June **1956.** 3 figs., table, 16 refs. **DWB**—Visual, photographic a day and night radio rates of meteor streams are compared with each other, with rainfall Sydney, Australia, 30 days later (Nov.–Jan.) and with noctilucent cloud (May–Aug.). T ratio of stream to sporadic meteors is not great enough to explain changes of rainfall. T most spectacular meteor showers have not been followed by notable world-wide rainfall. It possible that large numbers of micrometeorites in meteor streams could affect rainfall and mechanism of the removal of these from streams is suggested. *Subject Headings:* **1. Mete influences 2. Precipitation variations.**—*C.E.P.B.*

7.10–236 551.577.33(4

*Sanson, J., **Les précipitations de la période 1942–1953 en France.** [Rainfall in Franc 1942–1953.] *La Météorologie*, Paris, Ser. 4, No. 36:442–452, Oct./Dec. **1954.** fig., 9 table **DWB**—An analysis of old documents relating to variations of the climate of France sho that since the 16th century groups of about 40 dry years alternated with groups of abo 40 rainy years, thus completing a whole cycle in 80 yrs (to be associated with CLAYTON's year solar wave). As the last completed period (1901–1942) was rainy it is assumed that t current period will be dry. This supposition seems to be confirmed, at least for the first pa of the present period, in 8 large agricultural regions (1942–1953) by the results of a detaile study of precipitation amounts which are deficient in all regions, by the number of dry month the long periods of continuous drought and the comparatively small number of days wit heavy rains and thunderstorms, as well as the deviation of the water levels from the normal All these data are presented in corresponding tables and discussed separately. *Subject Hea ings:* **1. Precipitation cycles 2. Drought periods 3. Precipitation amounts 4. Franc** —*A.M.P.*

7.10–237 551.577.37:551.509.3(944) 551.579.4:551.577.61(94

*§Bond, H. G. and Wiesner, C. J. (*Met. Bureau, Sydney*), **Floods of February 1955 in Ne South Wales.** *Australian Meteorological Magazine*, Melbourne, No. 10:1–33, Sept. **195** 15 figs., 2 tables, 5 refs. **DWB**—During the last few days of Feb., 1955, torrential rain c tropical origin caused record flooding of the Hunter River, and of all inland streams in Ne South Wales from the Bogan to the Gwydir. Serious loss of life and damage amounting t many millions of pounds resulted from the floods. The meteorological situation was remark able for the penetration so far southward of a deep stream of nearly saturated equatorial air resulting in rains of unprecedented intensity for inland areas of New South Wales. Thi report analyzes the synoptic situation prior to and during the flood rains, examines the rain fall distribution and intensity, and describes the resulting floods and damage. Conclusion are drawn as to whether a greater flood would be possible in the basins of the Hunter an Macquarie rivers. *Subject Headings:* **1. Rainstorms 2. Synoptic studies 3. Flood damag 4. New South Wales, Australia.**—*Authors' abstract.*

7.10–238 551.577.37(415

*Dixon, F. E., **Extremes of precipitation in periods of consecutive months.** *Eire. Me teorological Service, Technical Note*, No. 19, May **1955.** 15 p. 5 figs., 8 tables, 7 refs., 5 eq Price: 1s 0d. **DWB**—The analysis of monthly rainfall records for Valentia, Ireland (1866

nows that month-to-month persistence of wet or dry months is so small as to be neg- Statistical methods are used to construct graphs showing extremes of precipitation in es of 1 to 12 or 24 consecutive months according to actual data compared with curves l from formulas consisting of 3 terms, one determined by the normal, one by random res from normal, and one for the regular annual variation. Three formulas are used, normal year deviations, one for extreme years, and one extending to 24 months ignoring term. The last does not give a very good fit near the ends of the curves. Using data her regions of Ireland, and for different periods of record, a remarkable agreement in nts is noted. Methods of GLASSPOOLE (1930) are followed. *Subject Headings:* pitation extremes **2. Long period records 3. Valentia, Ireland.**—*M.R.*

0–239 551.577.37

dewald, M., **Globale Niederschlagsschwankungen.** [Global rainfall variations.] *u*, Frankfurt a.M., 56(13):394–395, July 1, **1956.** 2 figs. **DLC**—Variations of global may be due to changes of solar radiation or of the intensity of the atmospheric circula- CLIMAT data show that in 1954 mean rainfall (797 stations covering $\frac{3}{4}$ of land area) .4 mm or 5.36% above normal. Previous years are compared; only 1916 (+59.7 mm) nier. The excess in 1954 was greatest in July and Aug. It is unlikely that it was due n bombs. *Subject Headings:* **1. Excessive rainfall 2. Rainfall variations.**—*C.E.P.B.*

10–240 551.577.38:519.24(73)

umbel, Emil J., **Statistical theory of droughts.** *American Society of Civil Engineers, dings*, Vol. 80, Separate, No. 439, May **1954.** 19 p. 4 figs., 5 tables, 12 refs. **DWB**— hts are analyzed by the asymptotic theory of smallest values of a limited statistical e. The extremal probability paper used for floods is used for the logarithms of droughts. lower limit of the discharges is assumed to be zero the probability function of the droughts ues a straight line. If the lower limit exceeds zero, the three parameters in the probability on are estimated by the method of moments. A given statistical criterion indicates er or not the lower limit may be assumed to be zero. Observations on the droughts of ers in U. S. analyzed by this procedure show a close conformance with the theory. There- extrapolation is permissible if the basic conditions prevail. *Subject Headings:* **1. Drought ency theory 2. Statistical theory of drought 3. Extreme value theory 4. Flood fre- ies 5. United States.**—*Author's abstract.*

## RAIN AND SNOW

*See also:* **Forecasting from snow crystals** (Brooks), 7.10–108; **Hyperelectrification of raindrops** (Gunn), 7.10–296.

7.10–241 551.578.11

Kinzer, Gilbert D. and Cobb, William E., **Laboratory measurements of the growth and ction efficiency of raindrops.** *Journal of Meteorology*, 13(3):295–301, June **1956.** 6 figs., fs., 2 eqs. **DWB**—Growth of single drops of initial radius 5.2$\mu$ supported on rising cloud e water content 5.5 to 10.9 g/m$^3$ and known droplet radius distribution was studied (ap- us described). The collection efficiency of a falling drop was compared with LANGMUIR's sis. It was found that a raindrop with radius <150$\mu$ has a collection efficiency smaller theory predicts. From 150$\mu$ to 0.5 mm collection efficiency was larger than theory ly 100% at 0.2 to 0.3 mm), and from 0.5 to 0.8 mm again smaller. *Subject Headings:* indrop coalescence **2. Langmuir's theory.**—*C.E.P.B.*

7.10–242 551.578.11:531.52

Lodge, James P., Jr., **The position and shape of impacted water droplets in an oil film.** *nal of Meteorology*, 13(3):310–311, June **1956.** 9 refs. **DWB**—Drops of 1 microliter lowered on to the surface of a silicone oil film and others inserted into the film. Both (×35) and smaller drops sprayed on were spherical. Drops on the slide beneath the ere distorted. *Subject Heading:* **1. Raindrop shape investigation.**—*C.E.P.B.*

7.10–243 551.5

Bartnicki, Leonard, **Zagadnienie klimatologiczne dotyczące opadow w postaci st** [Climatological problems on solid precipitation.] *Przegląd Meteorologiczny i Hydrologic* Warsaw, 8(2):163–164, **1955.** fig., table. **DWB, DLC**—A summary of F. LAUSCH paper published in *Archiv für Meteorologie, Geophysik and Bioklimatologie* (*see* 5.11–162, N 1954, *MAB*), establishing the relationship between the amount of solid precipitation per cent to the total precipitation amount) and the mean monthly and annual air temperat LAUSCHER expressed this relationship by the empirical formula $F = 50 - 5t$, where $F$ is the r of solid precipitation to the total precipitation amount (expressed in %) and $t$ is the m monthly temperature of a given locality. Mean values of this relationship for lowlands mountainous areas calculated by LAUSCHER on the basis of observational data in the east Alps at 300 and 280 m altitude, in south Norway (100 and 2000 m) and in the Arctic at vari mean monthly temperatures (from −9 to 13°C) are presented in tables. They show tha mountain areas the percentage of solid precipitation increases with the height because of drop of the mean temperature. *Subject Headings:* **1. Temperature of snowfall 2. Lauscher** —*A.M.P.*

7.10–244 551.578.41:551.52

Gold, L. W. and Williams, G. P., **Dependence of snowfall on temperature.** *Natu* London, 177(4520):1137–1138, June 16, **1956.** 2 figs., 4 refs. **DWB**—On Old Glory M Canada, 7700 ft, most snow falls at a temperature of about −10°C in Dec. through Mar but at higher temperatures in Oct., Nov., April and May. This may merely reflect t frequency distribution of temperatures at the level of observation. At Montreal snow amount was correlated with estimated temperature at the level of formation; it was fou that snow was most likely to come from cloud between −10 and −20°C. The snow w mostly irregular assemblages of columns and plates, which according to NAKAYA form at − to −14 and −17 to −20°C. *Subject Heading:* **1. Temperature of snowfall.**—*C.E.P.B.*

7.10–245 551.578.41:77

Higuchi, Keiji, **A new method for the simultaneous observation of shape and size o large number of falling snow particles.** *Journal of Meteorology*, 13(3):274–278, June 19 9 figs., table, 8 refs. **DWB**—A glass plate covered with silicone oil is exposed to falling sno then inserted in a dark box directly above a sheet of photographic paper and briefly lit by flashlight, giving a shadow picture. Enlargements showed fine details of structure. Relatio between mass and diameter are calculated. The size distribution of component crystals in snowflake was determined; two types were found representing coalescence of equal or unequ crystals, the latter being the more frequent. *Subject Headings:* **1. Snow crystal structu 2. Snow crystal photography.**—*C.E.P.B.*

7.10–246 551.578.4

Magono, Chōji and Arai, B. (*Yokohama National Univ.*), **On the split of snow flake** *Meteorological Society of Japan, Journal, Ser. 2*, 32(11/12):366 344, Nov./Dec. **1954.** 9 figs table, 11 refs. In Japanese; English summary p. 336. **MH-BH**—The mass-distribution raindrops and solid precipitation elements produced by the northwest monsoon was observe by the photographic method at Shiozawa in midwinter, 1953, and it was found that th distribution of raindrops or small snow particles follows MARSHALL and PALMER's formul but that of snowflakes is extremely different. In the case of precipitation which include snow flakes, the distribution of small precipitation elements was smaller than that shown b MARSHALL and PALMER's formula, but that of snow flakes was much larger than that repre sented by their formula. Many snow flakes of equivalent diameter larger than 4 mm we measured, although raindrops observed in the period were all smaller than 2 mm in diamete From these results, it was suggested that the snow flakes would split in falling before they me into raindrops. *Subject Headings:* **1. Snowflake size distribution 2. Precipitation forma tion 3. Shiozawa, Japan.**—*Authors' abstract.*

7.10–247 551.578.411:778.3

†Magono, Chōji (*Yokohama National Univ.*) and Oguchi, H. (*Tokyo Univ. of Arts*), **Class fication of snow flakes and their structures.** *Meteorological Society of Japan, Journal, Ser.*

(2):56–67, March 1955. 2 figs., 4 tables, 16 refs. In Japanese; English summary p. 56. **WB, DLC**—Many snow flakes were photographed during 1951–1954 in Japan, and they were ssified according to four methods, i.e., their historical processes, shapes in falling state, es and crystal habits. It was observed that the snow flakes change their crystal state in e process similar to that of fallen snow. Considered aerodynamically, the shape and velocity snow flakes in falling state, an idea for estimating the uniformity of crystal habits in snow kes was obtained. In the photographs of snow flakes hitherto obtained, it was found that r snow flakes may be formed with one respective type only, while in another instance almost l combinations of the different types may be formed. All the geometrically possible ways r the adhesion of snow crystals, namely: top-top, top-surface, surface-surface, surface-edge ie, line-line, intertwined adhesion were found in the snow flakes. The top of branch of ndritic crystals plays a leading role in the adhesion mechanism between the crystals. From ose results, it was presumed that the great snow flakes might be composed of snow crystals of ndritic type. *Subject Headings:* **1. Snow crystal structure 2. Snow crystal photographs.**—*Authors' abstract.*

7.10–248 551.578.45:551.524.32

Berkes, Zoltán, **Az idei április rendkívüli időjárása.** [Unusual weather in April 1955.] *Időjárás*, Budapest, 59(3):187–189, May/June **1955.** 3 figs., table. Also: Ozorai, Zoltán, **Áprilisi hóviharok a Bakonyban és a Bükkben.** [April snowstorms in the Bakony and Bükk Mountains.] *Ibid.*, p. 190–192. fig. Also: Őrszigeti, Frigyes, **Hóval lepett virágzó mandulafa Sopronban, 1955. április 19-én.** [Blossoming almond tree covered with snow in Sopron on April 19, 1955.] photo facing p. 177. **DWB, DLC**—Temperature development of April 1955 is described and compared with other unusually cold Aprils in Hungary during the last 70 years. The synoptic development leading to snowstorms on April 16 and 18 is analyzed. *Subject Headings:* **1. Cold springs 2. Snowstorms in spring 3. Hungary.**—*G.T.*

7.10-249 551.578.7

Popov, A. P., **Nebyvalyĭ grad v Stalingradskoĭ oblasti.** [Unprecedented hail in Stalingrad Oblast.] *Priroda*, Moscow, 44(5):112–113, May **1955. DLC**—An unprecedented hail storm accompanied by a downpour occurred in the vicinity of Slashchevskaia on Sept. 19, 1954. The large black cloud coming from NW and sweeping along huge masses of soil and dust appeared about 4 p.m. and moved quickly in the direction of the village, continually changing its color. At its approach to the village it became steel-grey and burst into rain and hail which lasted for 1 hr. About 400 hailstones were counted on one sq m. They began to melt toward evening when streams of melted water running along ravines tore down bridges and covered fields and vegetable gardens with silt and stones. Many roofs were torn off by the hurricane wind which attained a speed of 10 (Beaufort force). *Subject Headings:* **1. Hailstorms 2. Hurricane force winds 3. Rainstorms 4. Stalingrad, U.S.S.R.**—*A.M.P.*

## HYDROMETEOROLOGY

*See also:* **Realms of water** (Kuenen), 7.10–4; **Practical hydrometry** (Luchsheva), 7.10-5; **Water balance of Antarctica** (Kosack), 7.10-28; **Freezing of water in soil** (Kretschmer), **7.10–191; Feb. 1955 floods, New South Wales** (Bond, Wiesner), 7.10–237; special bibliography on **Hurricane and Storm Surge Damage,** p. 1270.

7.10-250 551.579.5:551.573:631.67

Blaney, Harry F. (*U. S. Agricultural Res. Serv.*), **Climate as an index of irrigation needs.** *U. S. Dept. of Agriculture, Water: the Yearbook of Agriculture*, 1955:341–345, pub. **1955.** tables. **DA, DWB**—The Blaney-Criddle formula used to correlate consumptive-use data for different crops with monthly temperature, per cent of daylight hours, precipitation, frost-free period or irrigation season is $U=KF=\Sigma kf$, where $U$ is consumptive-use of crop (evapotranspiration) in inches for any period, $F$ is the sum of the monthly consumptive-use factors ($f$) for the period which in turn is the product of mean monthly temperature and per cent of daytime hours of the year (as given in table for lat. 24°, 26° . . . 48°, 50°N, for each month), $K$ is an empirical coefficient for growing or irrigation season, and $k$ the monthly coefficient.

Methods of use, irrigation efficiency, and consumptive use-rainfall (*U-R*) are tabulated f various crops for Montrose, Colo. *Subject Headings:* **1. Evapotranspiration 2. Plant wa requirements 3. Irrigation 4. Montrose, Colo.**—*M.R.*

7.10–251 551.579:551.50

Dean, W. W.; Frost, W. T. and Kuehl, D. W., **Effect upon seasonal runoff foreca of measurement errors in basic data.** *Western Snow Conference, Salt Lake City, April 19 Proceedings*, p. 90–94, pub. **1954.** 2 tables, 5 refs. **DWB**—Random errors in the independe or basic historical data used to compute runoff regression curves, length of record or size sample, random errors in current synoptic data used in preparing the forecasts, and errors subsequent runoff data will all affect the accuracy of the forecasts. Magnitude of error resu ing from errors in measurement of rainfall or snow water equivalent depends on regressi coefficients as well as on absolute value of error. Four types of errors mentioned are on occasionally additive (they may compensate). Errors in independent variables, bias t regression coefficients downward. Historical data cannot be improved very much, b observing and instrumental errors can be reduced by training. Random errors have be introduced into data used in a test case (Boise River above Diversion Dam, Idaho) usi 1935–53 data, to test the theory as to magnitude of errors in resulting seasonal forecast *Subject Headings:* **1. Seasonal runoff forecast errors 2. Random observation error effec 3. Runoff forecasts, Boise River, Idaho.**—*M.R.*

7.10–252 551.579:551.4

Melin, Ragnar, **Run-off in Sarek.** *Arkiv för Geofysik*, Stockholm, 2(7):139–149, 195 7 figs., 2 tables, 3 refs., 2 eqs. **DLC**—Short description of automatic water and weath indicator. Monthly discharges (1931–1945) given for the Rapaälven River, draining t Sarek Mountain area (up to 2100 m, with glaciers). Average annual runoff 1340 mm. A suming evaporation as 150 mm, the annual precipitation is about 1500 mm. Runoff valu are given for 13 other mountainous catchments. Annual and daily variations which a related to temperature and precipitation are discussed. *Subject Headings:* **1. Runoff variation 2. Mountain hydrology 3. Sarek Mountain, Sweden.**—*A.A.*

7.10–253 551.579.

†American Geophysical Union. Committee on Infiltration, [**Report of**] **the Committe 1953–1954.** Leonard Schiff, chairman. *American Geophysical Union, Transactions*, 36(4) 709–712, Aug. **1955.** 11 refs. Also: **Report, 1954–1955.** *Ibid.*, 36(5):907–911, Oct. 195 25 refs. **DWB, DLC**—The first article contains brief reports of 20 investigations on infiltrom eters, seepage, nitrogen losses from soil, erosion, rainfall and runoff relations, effect of vegeta tive cover, etc. in all parts of the United States. The second article contains abstracts fro committee members of the following reports: infiltrometer work, infiltration relative to runoff infiltration relative to water spreading, and infiltration soil moisture and hydraulics. Th general and cited references are listed. *Subject Headings:* **1. Infiltration 2. Infiltrometer 3. United States. I. Schiff, Leonard.**—*M.R., I.L.D.*

7.10–254 551.579.4:551.509.58(771

*Kresge, Ralph Franklin and Nordenson, Tor J., **Use of flood forecasting procedure in the derivation of flood frequencies.** U. S. Weather Bureau, [1954?]. 11 p. 8 figs. 5 tables, 2 refs. **DWB** – It is shown that estimates of peak discharges for given periods (e.g. 10–100 years) are more reliable for engineering purposes (design of culverts, bridges, etc. if based on an extrapolation of short-period records of runoff (say 10 years) by means of analysis of long period (e.g., 50 year) precipitation records. The procedures outlined are applied to the Hocking River at Athens, Ohio, with a drainage area of 944 sq mi. Records for 1915–1951 were analyzed. Forecast relations were developed by staff of U. S. W. B. River Forecast Center at Cincinnati, Ohio, using LINSLEY and KOHLER's technique of computing runoff from storm rainfall and use of SHERMAN's Unit Hydrograph method. Annual peak discharges computed from relation calculated from 11 years (1940–50) data agree well with actual. GUMBELS's (1943) method is used to compute annual peak discharges. *Subject Headings:* **1. Flood frequency calculations 2. Flood forecasting procedures 3. Hocking Valley, Ohio.**—*M.R.*

# CLIMATOLOGY AND BIOCLIMATOLOGY

## CLIMATOLOGY

7.10–255 551.58:69

Boyd, Donald W. (*Met. Off., Toronto, Canada*), **The climate part of the National Building Code of Canada.** *American Meteorological Society, Bulletin*, 36(7):347–349, Sept. **1955.** refs. **DWB, DLC**—The section of climate contains 12 maps of Canada showing variations individual weather elements such as winter design temperatures, mean annual total degree ays, mean annual total precipitation, snow load, etc. The solution and computation of sign temperatures, computed snow load, and wind gust data are discussed. *Subject Headgs:* **1. Climate of Canada 2. Degree days 3. Design temperatures 4. Building climatology Canada.**—*I.L.D.*

7.10–256 681.177:551.58(497.1)

Guilloux, L. Marcel, **Statistiques climatologiques en Yougoslavie.** [Climatological atistics in Yugoslavia.] *United Nations. Technical Assistance Program*, TAA/NS/YUG/11, ov. 19, **1954.** 12 p. **DWB**—Recommendations of member of WMO-UN Technical Assistice mission, made after 7 weeks in Yugoslavia (Nov. 1953–Jan. 1954) at Belgrade and 4 her centers (Macedonia, Bosnia-Herzegovina, Croatia and Slovenia) to take stock of climatic ata available for punching, including machines needed, costs for cards, operators, machines, c. and a progressive program for a service with a limited budget, to begin punching current ata on a modest scale, and for types of summaries and publications which could be realized. *ubject Headings:* **1. Punched card programs in climatology 2. Yugoslavia.**—*M.R.*

7.10–257 551.58:012

Thom, E. C. (*U. S. W. B., Wash., D. C.*), **Sources of U. S. climatological data.** *U. S. Weather Bureau, Weekly Weather and Crop Bulletin*, 42(19):8, May 9, **1955. DWB**—A guide or those who are concerned with climate and desire climatic information, giving names, ontent and details on the U. S. Weather Bureau publications—either national, for one or a ew states, or of local interest. *Subject Headings:* **1. Climatic data sources 2. Climatological ublications 3. U. S. Weather Bureau publications 4. United States.**—*A.M.P.*

## CLIMATE OF PARTICULAR PLACES

7.10–258 551.582.1(437) 551.586:615.8

*Petrovič, Štefan, **Nástin klímy Štos kúpel'ov.** [Sketch of the climate of the Štos health resort.] *Meteorologické Zprávy*, Prague, 8(6):145–153, **1955.** 4 figs., 8 tables, 5 refs. Russian and German summaries p. 145. **DWB**—Climatic data of the Štos health resort (situated in eastern Slovakia on the south slope of a mountain at 650 m) are analyzed from non-continuous records of 15 complete years from 1930 to 1954. The values tabulated and analyzed are: average and extreme monthly temperature (including number of days with inversions of specified magnitudes), frequency of specified daily temperature values, monthly precipitation and number of days with precipitation, relative humidity and number of days with fog, cloudiness, sunshine (as computed from cloudiness values), wind conditions, first and last days with snow, frost, thunderstorm, etc. and length of the seasons. *Subject Headings:* **1. Climatic data 2. Health resorts 3. Štos, Czechoslovakia.**—*G.T.*

7.10–259 551.582.1(456.3)

*†Riccardi, Mario, **Il Cicolano: studio di geografia umana.** [Cicolano: a study in human geography.] *Società Geografica Italiana, Rome, Bollettino*, Ser. 8, 8(4/5):153–222, April/May **1955.** 16 figs., photos, tables, 65 refs. English summary p. 221–222. **DWB**—Details of seasonal variations in temperature and precipitation at various stations and various altitudes (500 m to 2200 m) in the Cicolano region of Italy (near Rome) are given in Pt. III (p. 163–168) of this comprehensive study of physical and human geography of the area. Snow cover and duration at different altitudes are also mentioned. *Subject Headings:* **1. Climate of Cicolano, Italy 2. Cicolano Region, Italy.**—*M.R.*

7.10–260 551.582.1(7

*Longley, Richmond W., **Climate of Montreal.** Ottawa, Meteorological Div., Air Serv Branch, Dept. of Transport, **1954.** 46 p. 24 tables, 15 figs., 7 refs. **DWB**—Continu daily observations of temperature, pressure, wind and precipitation beginning with 1 (at McGill Univ.) and ending with 1949–51 are summarized and discussed by months and elements in this attractive popular monograph. Data for each month are presented in tab and graphic form. Heat and cold, wet and dry, windy and frosty dates or periods are a summarized. The effect of topography, and of climatic trends, degree-days, comfort, moisture, etc. are also discussed. Precipitation fluctuates randomly, but temperature a snowfall show a decided trend during the 80 years of record presented (temperature +3.0 snowfall −30 in. per year). Temperature, precipitation and sunshine at 13 other Ameri cities (Canada, U. S. and Bermuda) are shown for each month in a comparative table. *Sub Headings:* **1. Climate of Montreal, Canada 2. Montreal, Canada.**—*M.R.*

7.10–261 551.582.2(5

*Iraq. Meteorological Dept., **Climatological means for Iraq.** June, July and Aug. 19 3 pieces (about 11 p. each). mostly tables. Title-page in English and Arabic. Leger and text in English. **DWB**—Each monthly report contains a summary table for 10 static in Iraq, giving precipitation, temperature, days with rain, snow, hail, thunder, fog, du clear, cloudy and gale, sunshine hours and earth temperature at grass, 1 ft and 4 ft dep Daily maximum and minimum temperature; 3 hourly means, temperature, pressure, relat humidity, vapor pressure, dew point, cloud amount and low cloud; daily precipitation, surf wind direction, frequency (3-hourly) for all 10 stations are also given. *Subject Headin* **1. Monthly climatic summaries 2. Climate of Iraq 3. Iraq.**—*M.R.*

## CLIMATIC VARIATIONS

*See also:* **Radio emission from Jupiter** (Ovenden), 7.10–17; **Geomorphic and climatic history of arid regions** (Miller), 7.10–272; **Climatic morphology and plant development, S. America** (Wilhelmy), 7.10–274.

7.10–262 551.583.2:551.311.12(235.

Kick, Wilhelm, **Chogo Lungma glacier, Karakoram.** *Geographical Journal*, Londo 122(1):93–96, March **1956.** map, 2 photos, 10 refs. **DWB**—This large valley glacier (36° 75°E) is described and mapped. Earlier surveys back to 1835 are compared. In 1835 had been advancing for some time; it reached its maximum after 1861, forming a large morai In 1902 it had begun to retreat, probably not long before, and it was still retreating in 19 with an interruption about 1913. *Subject Headings:* **1. Glacier variations 2. Karakora** —*C.E.P.B.*

7.10–263 551.583.3:551.311.2(61

Coque, Roger, **Morphologie et croute dans le Sud-Tunisien.** [Morphology and the earth crust in southern Tunisia.] *Annales de Géographie*, Paris, 64(345):359–370, Sept./Oct. 195 photos, table, foot-refs. **DLC**—Sec. IV (p. 365–9) takes up the effect of climate during t Quaternary on the geomorphology of southern Tunisia. A table shows physico-chemic processes, types of runoff, and consequent geomorphology for 6 climatic phases (humi increasing aridity, arid, decreasing aridity, humid, and present). Intense weathering occurre during the humid phases, but was negligible in the dry periods. The present period is o of slight erosion in comparison with previous phase. *Subject Headings:* **1. Quaternary climat 2. Geomorphology 3. Erosion 4. Southern Tunisia.**—*M.R.*

7.10–264 551.583.3(43

†Dylik, Jan, **Gegenwärtige Probleme der Periglazialforschung in Polen.** [Prese problems of periglacial investigation in Poland.] *Petermanns Geographische Mitteilunge* Gotha, 100(1):28–33, **1956.** 77 refs. **DLC**—Summarizes with numerous references researcha beginning with W. Lozinski (1909). Conceptions of weathering, frost soil structure, win effects, loess problems, correlation and geomorphology are broadly discussed. In 1954 a ne

riodical, the **Biuletyn Peryglacjalny,** appeared; contents are described in an appendix. *bject Headings:* **1. Periglacial climates 2. Poland.**—*C.E.P.B.*

7.10–265 551.583.3

Galen, Raimund, **Nekotorye voprosy paleogeografii chetvertichnogo perioda na territori l'shi.** [Some problems in the paleogeography of the Quaternary Period in Poland.] *iroda*, Moscow, 44(8):63–66, Aug. **1955.** 3 figs. **DLC**—Conceptions on pleistocene aciation in Poland vary from one single glaciation, four glacials and three interglacials to any as six glaciations. The extent to which surface relief reflects repeated glaciations, the velopment of periglacial processes, the extent to which contemporary divided periglacial uctures retain traces of the erosion relief formed during interglacial periods; the genesis of cent post-glacial forms during the last glaciation, etc., are discussed. A map showing the tent of the glaciations in Poland, a diagram of the distribution of marginal ridges and an ample of the intersection of ancient subglacial flow channel by a river valley are presented. *bject Headings:* **1. Quaternary glaciation 2. Glacial periods 3. Poland.**—*I.L.D.*

7.10–266 551.583.3:551.311.15(436)

Lichtenberger, Elisabeth, **Stadiale Gletscherstände in den Schladminger Tauern (Steiermark).** [Glacial stadia in the Schladminger Tauern.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, 3(2):235–244, **1956.** chart, 11 refs. German and English summaries p. 243–44. **DLC**—The various advances are identified as: Schlern stage, Snow line 1800 m; Gschnitz —2000 m, II—2100 m, III—2200 m; Daun (only on highest peaks) 2300–2400 m. The ow line about 1850 is estimated as 2700 m. *Subject Headings:* **1. Quaternary glaciation . Steiermark, Austria.**—*C.E.P.B.*

7.10–267 551.583.3:551.311.15(436)

Prey, S., **Die eiszeitlichen Gletscher im Traunstein-Zwillingskogel-Kamm und im Almtal ei Gmunden, Oberösterreich.** [Ice Age glaciers in the Traunstein-Zwillingskogel Ridge nd in the Ulm Valley near Gmunden, Upper Austria.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, 3(2):213–234, **1956.** chart, 7 photos, 12 refs. German and English summaries . 232–233. **DLC**—The Würm snow line was at about 1000 m for glaciers facing N, a little ower for those facing E, and 1150 m for those facing S. Moraines indicate a number of horter post-Würm advances. *Subject Headings:* **1. Quaternary glaciation 2. Austria.** .—*C.E.P.B.*

7.10–268 551.583.7:551.526.6

Bandy, Orville L. (*Dept. of Geology, Univ. of Southern California, Los Angeles*), **Paleoemperatures of Pacific bottom waters and multiple hypotheses.** *Science*, 123(3194):459–460, March 16, **1956.** 7 refs. Also: Emiliani, Cesare, (*Enrico Fermi Inst. for Nuclear Studies, Univ. Chicago*), **On paleotemperatures of Pacific bottom waters.** *Ibid.*, p. 460–461. table, 8 refs. **DWB, DLC**—Emiliani in *Science*, 119:853, 1954 (*see* 6.5–289, May 1955, *MAB*), found a temperature decrease of 8°C from mid-Oligocene to end of Pliocene from cores. Bandy queries some of the assumptions, partly on the ground that some foraminifera now abysmal may have had a shallow water habitat in Tertiary. Emiliani replies that bottom morphology and submarine geology confirm that the microfossils dated by oxygen isotope analysis grew in place at present depth and represent the bottom temperatures. *Subject Headings:* **1. Paleoclimatology 2. Ocean temperature changes.**—*C.E.P.B.*

## MICROCLIMATOLOGY

*See also:* **Nocturnal cooling in small pits** (Georgii), 7.10 183; **Energy exchange of an Alocasia leaf** (Raschke), 7.10–277.

7.10–269 551.584:551.501.4

Höhne, Werner, **Zur Auswertmethodik von Punktregistrierungen bei mikroklimatologischen Messungen.** [Evaluation of point records in microclimatic measurements.] *Angewandte Meteorologie*, Berlin, 2(7):212–217, April **1956.** 4 tables, 4 refs. **DLC**—Multiple

point recorders are often used in microclimatology. They are in the nature of samples wh do not give the true extremes. Author used a series of temperature points (10 cm above meadow) at 30 sec intervals and found the median $Z$ and arithmetic mean $M$ of 20 in each ho Differences $D=Z-M$ are tabulated. A short method of determining the scatter is devis in which the 3 extreme values on each side are eliminated from the 20 in the hour. Statisti tests show that this compares well with the standard deviation about $M$. *Subject Headin* **1. Microclimatic data evaluation 2. Methods of computation.**—*C.E.P.B.*

7.10–270 551.584:551.311

*Kiss, Árpád, **Adatok a futóhomok mikroklímájához.** [Data on the microclimate shifting sand.] *Időjárás*, Budapest, 59(4):235–238, July/Aug. **1955.** 4 tables, 4 refs. Ru sian and German summaries p. 235. **DWB, DLC**—Local climatic data for the sandy regi of Üllés are compared with similar data for Szeged Airport and Szeged City. A comparis is also made between the microclimate of the bare dune tops and of the depressions cover with vegetation. Extreme values, warming and cooling rates, nighttime inversions a patterns of diurnal temperature variation are analyzed. *Subject Headings:* **1. Sand micr climatology 2. Climatic data 3. Microclimates 4. Üllés, Hungary 5. Szeged City, Hu gary.**—*Trans. of author's abstract.*

7.10–271 551.584.3(4

Bonacina, L. C. W., **Regional and local climatic factors.** *Weather*, 11(4):135, April 195 **DWB**—Note on the fact that spring is more advanced in the sheltered Thames valley than mid-Dorset and mid-Devon, although the latter are crossed by isotherms 2°F higher. *Subj Headings:* **1. Topographic effects 2. England.**—*C.E.P.B.*

7.10–272 551.584.7:551.583

Miller, John (*Pa. State College*) and Leopold, Luna B. (*U. S. Geological Survey, Was D. C.*), **Use of soils and paleosols for interpreting geomorphic and climatic history of ar regions.** *International Symposium on Desert Research, Jerusalem, May 7–14, 1952, Proceedin* p. 453–462, pub. Jerusalem, **1953.** fig., 31 refs. **DWB**—Caution is urged in use of paleoso as evidence for interpreting climatic events in arid and semi-arid regions. However, a quant tative rather than qualitative approach would give useful data for determining recent quate nary climate or climatic changes occurring at present. Various methods of measurement an their relative efficiency are discussed. Use of climatic history in management planning mentioned. Historic changes in soil and vegetation patterns in dry regions cannot be attrib uted solely to land use, as climatic changes have occurred. *Subject Headings:* **1. Soil clima tology 2. Paleosols as climatic indicators 3. Land management 4. Arid zones 5. Histor climates.**—*M.R.*

7.10–273 551.584.9:631

Raeuber, A., **Meteorologische Vergleichsmessungen zwischen Schuppenstall und Freilan in Gross-Lüsewitz.** [Meteorological comparisons between cow sheds and the open in Gross Lüsewitz.] *Angewandte Meteorologie*, Berlin, 2(7):217–222, April **1956.** 5 figs., 3 refs. **DL** —Two series (winter and summer) of measurements at 1 m height were made in an open she holding 15 calves, in the open, and (winter only) in an unheated store room. Correlatio coefficients, means and extremes of temperature and relative humidity are given. In winte the daily ranges of temperature in the open, cow shed and store room, were 7.7, 7.2 and 3.7°C in summer 8.3 in the open, 7.1 in the shed. The wind circulation in the shed is plotted. Th shed averaged warmer than the open in both seasons, and the summer relative humidity wa slightly higher in the shed with a smaller range. *Subject Heading:* **1. Shed microclimatology** —*C.E.P.B.*

## CLIMATIC CLASSIFICATION

7.10–274 551.585:551.58

†Wilhelmy, Herbert, **Die klimamorphologische und pflanzengeographische Entwicklun des Trockengebietes am Nordrand Südamerikas seit dem Pleistozän.** [Climatic morpho logical and plant geographical development of the drought region along the northern margi

South America since the Pleistocene.] *Die Erde*, Berlin, No. 3/4:244–273, **1954.** 3 figs., photos, 67 refs. **DWB**—The geology, geomorphology and vegetation of the islands of Bonaire, Curaçao and Aruba and of the adjoining western arid coast of Venezuela are described with special reference to the role of past and contemporary climate in their formation and persistence. A reconstruction of past climates and a descriptive account of the present are presented. *Subject Headings:* **1. Climatic morphology 2. Arid climates 3. Historical climates Venezuela Coast 5. Netherlands West Indies.**—*I.L.D.*

7.10–275 551.585.7(235.243)

Flohn, H., **Zum Klima der Hochgebirge Zentralasiens II.** [On the climate of the high mountains of central Asia, Pt. 2.] *Meteorologische Rundschau*, Berlin, 9(5/6):85–88, May/June **1956.** 6 tables, 12 refs. **DLC**—An account is given of the general weather sequence from climatological and aerological observations in Russian Turkestan, Pakistan and NW India in late Oct. and early Nov. 1954. The climatic observations (temperature, humidity, cloud, raindays and cloud movement) at the Himalaya camps, Karakorum and Nanga Parbat (3960–6300 m) are discussed. The best mountaineering season in Karakorum is June through Sept., especially Sept.; later there are long fine periods but also cold waves and storms. In the NW Himalayas May is best. (For abstract of Pt. 1, *see* 2K–254, Nov. 1951, *MAB.*) *Subject Headings:* **1. Mountain climatology 2. Himalayas.**—*C.E.P.B.*

## BIOCLIMATOLOGY

*See also:* **Climate and soil** (Lundegårdh), 7.10-6; **Heat transmission index in men** (Aschoff, Wever), 7.10–82; **Climate of Štos** (Petrovič), 7.10–258.

7.10–276 551.586

Słomka, J., **O tematyce prac w zakresie bioklimatologii wykonywanych w Zakladzie i Obserwatorium Meteorologii i Klimatologii Universytetu im. B. Bieruta.** [Bioclimatological work at the Institute and Observatory of Meteorology and Climatology of the B. Bierut University.] *Przeglad Meteorologiczny i Hydrologiczny*, Warsaw, 8(2):167–168, **1955. DWB, DLC**—The main subjects were: 1) A study of methods of determining biologically active short wave radiation of the sun and sky by means of a silver filter of a 3200 Å permeability, designed at the Institute. 2) A study of air pollution at Wrocław and the establishment of the correlation between pollution by dust and by other meteorological or industrial elements made with an Owens dust meter. It has been found that a) air pollution in winter is 4 times stronger than in the warm season; and b) there is a correlation between air pollution and some meteorological elements. Katathermometric measurements and systematic frigorimetric observations of cooling processes are being carried out, as well as first experiments of receiving and decoding of ursigrams (jointly with the Wrocław Observatory) for bioclimatological purposes. *Subject Headings:* **1. Bioclimatic research 2. Short wave radiation 3. Atmospheric pollution 4. Cooling power 5. Wrocław University, Poland.**—*A.M.P.*

7.10–277 551.586.5:551.584.42

Raschke, K., **Mikrometeorologisch gemessene Energieumsätze eines Alocasiablattes.** [Micrometeorological measurements of the energy exchange of an Alocasia leaf.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, Vienna, 7(2):240–268, **1956.** 8 figs., 6 tables, 42 refs. German, English and French summaries p. 240–241. **DWB**—The energy-balance of an Alocasia leaf is made up primarily of the radiation exchange in the visible and infra-red, of the convective transfer, and of the losses by transpiration. Each of these items has been split up into the values for the upper and for the lower surfaces of the leaf and was measured under different conditions *in situ*. Results are presented in the form of graphs showing the diurnal variations of the different energy components as well as in the form of balance sheets. Two methods were applied, both of which required direct radiation measurements. The first method further utilised determinations of the heat transfer coefficients and the relative "wetness factors" of the leaf surfaces, whereas the other method was based on measurements of the gradients of temperature and humidity close to the leaf. For both cases the ratio of the convective losses from both the surfaces of the leaf must be known (which

for a horizontal leaf almost always is equal to unity). In addition to this, the second meth requires information about the ratio of the Austausch coefficients for water vapour and he (experimentally it was found to be 1.00±0.05). The results give some insight regarding t radiative properties of an Alocasia leaf in the visible and infra-red and regarding the ratio the losses by transpiration and by convection and its effects on leaf temperature in sunshi The effect of radiation on transpiration proves to be strong; wind, however, has only lit effect. The stomata of both the leaf surfaces were functioning independently of each oth which resulted in peculiar variations in the ratio of the water lost by the upper and low surfaces. Finally, mutual relationships between energy exchange and microclimate a discussed. *Subject Heading:* **1. Plant micrometeorology.**—*Author's abstract.*

## ENVIRONMENTAL INFLUENCES

*See:* **Rainfall in different woodlands** (Ovington), 7.10–59; **Meteoric influences on weather** (Bowen), 7.10–233

## SYNOPTIC CLIMATOLOGY

*See:* **Low cloud, poor visibility analysis** (Baker), 7.10–48; **Met. data, Indonesian Aerodrome, 7.10–50.**

# MISCELLANEOUS

## SOLAR INFLUENCES

*See also:* **Radio emission from Jupiter** (Ovenden), 7.10–17; **Cold Feb. 1956** (Faust), 7.10–107; **Meteoric dust in atmos.** (Link), 7.10–121; **Meteors and rainfall** (Whipple, Hawkins), 7.10–235.

7.10–278 551.590.24:551.52

Dogniaux, R., **Observations de la radiation solaire durant l'éclipse du 30 juin 1954.** [Sol radiation observations during the eclipse of June 30, 1954.] *Ciel et Terre*, Uccle, 70(7/8):289 297, July/Aug. **1954.** 6 figs. **DLC**—Graphical presentation given for global and diffus solar radiation, showing the gradual reduction in intensity during the eclipse. No effect wa noticed in the temperature measured in the screen, while decrease was observed near th earth's surface, especially over bare soil. *Subject Headings:* **1. Eclipse effects on solar radiatio 2. Brussels, Belgium.**—*A.A.*

7.10–279 551.590.24:550.3

van Wijk, A. M. (*Magnetic Obs., Hermanus, S. Africa*), **Magnetic effects during sola eclipses.** *Journal of Geophysical Research*, Wash., D. C., 60(3):297–298, Sept. **1955.** 2 figs. 2 refs. **DLC**—To investigate solar eclipse effects of Dec. 25, 1954, a study was made of th day-to-day trend in the hourly values of the magnetic elements at Hermanus, South Africa during the control period Dec. 23–26, 1954. A cooperative program is suggested. *Subject Heading:* **1. Solar eclipse effects.** —*Author's abstract.*

## VISIBILITY

7.10–280 551.591 551.508.92

U. S. Weather Bureau, **Final approach visibility studies.** Project ANDB 4.4, Fina report, prepared for the Air Navigation Development Board. April **1955.** 104 p. table 45 figs. (some fold., some photos), 14 refs. **DWB**—This is the complete and detailed report on all phases of the project, conducted by the U. S. W. B. under the direction of the late Benarthur C. Haynes for studying the usefulness of transmissometers and ceilometers for improving daytime and nighttime visibility and ceiling observations for landing of aircraft

t airports. The project was begun in Oct. 1951 and continued through 1953. Four pre-minary reports were prepared, two of which have been abstracted (*see* 4.6 243, June 1953 nd 6.6–16, June 1955, *MAB*). It is concluded that the transmissometer and rotating-beam eilometer are suitable for routine operational use but twilight calibrations have not yet been atisfactorily worked out for the transmissometer; the pulsed-light cloud range meter is not uitable for slant visual range determination; television is an aid for visibility determinations n the daytime but not at night. Further tests of slant visual range observation and develop-ent of new methods and forecasting techniques are recommended. All equipment tested uring this project is described and illustrated, results are presented in graphs and tables and valuation made at every step of the tests. *Subject Headings:* **1. Visibility research 2. Ceil-meters 3. Transmissometers. I. Haynes, Benarthur C.**—*M.R.*

7.10–281 551.591.34:551.510.42(794)

*Neiburger, Morris, **Visibility trend in Los Angeles.** *Air Pollution Foundation, Los ngeles, Report*, 1(11), Sept. **1955.** 45 p. 3 figs., 8 tables. **DWB**—Records of visibility, ind speed, relative humidity and other elements for the 0500, 1200 and 1700 PST observations t the Los Angeles City Office for the period 1933–1954 inclusive were struck on punched cards nd tabulated according to various categories of each. It was found that visibility definitely eteriorated from 1933–37 to 1944–49 and then improved somewhat. Control measures ffected since 1947 have considerably increased the incidence of good visibility in spite of a 5% increase in population and industry. In order to eliminate effects of climatic variations, ind direction speed and humidity were correlated with visibility by punched card techniques nd found to have little effect on general statistical trends. The frequency of visibility of 5 miles or more at 5 p.m. dropped from 27% to 5% and then increased to 11% in 1932–7, 944 9 and 1950–54 periods, respectively. *Subject Headings:* **1. Visibility data analysis . Visibility in urban areas 3. Smog 4. Los Angeles, Calif.**—*M.R.*

## OPTICAL PHENOMENA

7.10–282 551.593.1 551.593.51

**Abnormal refraction [in] North Atlantic Ocean, Western approach to Gibraltar, Baltic ea, Red Sea [and] Persian Gulf.** *Marine Observer*, London, 26(172):82–84, April **1956.** ff figs. **DLC**—A number of cases are described and illustrated. A series of sketches are iven of the distortion of the setting sun in the Persian Gulf, which gave a green flash just rior to disappearance. *Subject Headings:* **1. Refraction phenomena 2. Mirages 3. Green ash.**—*C.E.P.B.*

7.10–283 551.593.11

Jezek, — and Kolďovský, Milan, **Totální reflexe na inversních vrstvách pozorovaná s Milešovky dne 18. listopadu 1953.** [Total reflection from an inversion layer observed from Milešovka, Nov. 18, 1953.] *Meteorologické Zprávy*, Prague, 7(1):11–12, Feb. **1954.** 15 figs. **)LC**—Cases of total reflection over mountain tops were observed from 7 to 12 a.m., Nov. 18, 953. These phenomena, rare in Czechoslovakia, occurred during anticyclone situations haracterized by strong inversions up to 2,000 m and very low relative humidity. Several rawings are presented, showing the appearance of the reflections at different times. *Subject leadings:* **1. Superior mirages 2. Inversion layers 3. Milešovka, Czechoslovakia.**—*G.T.*

7.10–284 551.593.54

Volz, F. (*Johannes Gutenberg Univ., Mainz*), **Atmospheric turbidity and its spectral xtinction.** *Geofisica Pura e Applicata*, Milan, 31:119–123, May/Aug. **1955.** 7 figs., 9 refs. rench and German summaries p. 119. **DWB, DLC**—The indices of the wavelength depend-ncy of the haze extinction, which were currently determined from measurements of solar adiation and visibility at Mainz, show pronounced seasonal variations. The summer values re in general definitely higher than in winter. There is no connection with the scatter light ypes of the sky light or with the meteorological situation. *Subject Headings:* **1. Turbidity . Haze.**—*Author's abstract.*

7.10–285 551.59

Barber, A. W. E., **Sun pillar.** *Meteorological Magazine*, London, 85(1007):155, May 19 photo. **DWB**—Feb. 23, 1956 at Houghton Regis, amber in color fluctuating in a perioc 3–10 sec. *Subject Heading:* **1. Sun pillars.**—*C.E.P.B.*

7.10–286 551.593

Caroli, G., **Beobachtung eines seltenen Halos.** [Observation of a rare halo.] *Mete logische Rundschau*, Berlin, 9(3/4):72, March/April **1956.** fig., ref. **DLC**—Lunar halo C 26, 1955, at Freiburg. Corona (3°, colored), complete halo of 8–10° with paraselenae, a 22° halo. *Subject Heading:* **1. Halo observations.**—*C.E.P.B.*

7.10–287 551.593

**Solar halo [in] North Atlantic Ocean. Lunar halo [in] East African waters, No Atlantic Ocean.** *Marine Observer*, London, 26(172):84–86, April **1956.** fig. **DLC**— Atlantic, solar altitude 58°, elliptical halo circumscribed round 22° halo. E. Africa, lu altitude 34–44°, circumscribed elliptical halo. N. Atlantic, lunar halo of 17° radius (Rank halo). *Subject Headings:* **1. Halo observations 2. North Atlantic.**—*C.E.P.B.*

## ELECTRICAL PHENOMENA

*See also:* **Thunderstorms and electricity supply** (Prentice), 7.10–62; **Air pollution effects on conductivity and ion balance in atmos.** (Phillips et al.), 7.10–124; **Ionospheric results during eclipses** (Hunaerts, Nicolet), 7.10–132; **Electron distribution in ionosphere** (King, Cummack), 7.10–133; **Formation of F1 and F2 layers** (Ratcliffe), 7.10–137; **Night spectrum analysis** (Barbier), 7.10–172; **Height of 5577 emission line of airglow** (Elsässer, Siedentopf), 7.10–173; **Equilibrium of ionization** (Holl, Mühleisen), 7.10–222.

7.10–288 551.593.7:551.508

California. Univ. at Los Angeles, Dept. of Meteorology, **Investigation of polarizati of skylight.** Contract AF 19(122)-239, Final Report, June **1955.** 68 p. numerous fi (photos), 3 refs., numerous eqs. Appendixes (contents): Seaman, Clay H. and Seke Zedenek, **Photoelectric polarimeter for measurement of skylight polarization.** 18 p. 4 fig 2 photos, eqs. Coulson, Kinsell L. and Sekera, Z., **Distribution of polarization and the orien tion of the plane of polarization of sky radiation over the entire sky in a Rayleigh atmosphe** 10 p. 10 figs., ref., 6 eqs. Fraser, Robert S., Jr., **Theoretical positions of maximum degr of polarization.** 4 p. 2 figs., eqs. Sekera, Z., **Scattering matrix for spherical particles a its transformation.** 15 p. fig., 34 eqs. Fraser, R. S., Jr. and Sekera, Z., **Effect of specul reflection in a Rayleigh atmosphere.** 12 p. 3 refs., 24 eqs. **DWB**—This study of t polarization of skylight was undertaken in order to obtain a better quantitative measure of t atmospheric turbidity, leading to the determination of the size distribution of aerosol particle The measurements were made in six narrow spectral regions at several locations and und different turbidity conditions, with a specially constructed photoelectric polarimeter, maki it possible for the first time to extend polarization measurements into the ultraviolet regi and to measure the polarization continuously from sunrise to sunset. The results of t measurements were compared with the theoretical values for a *molecular* atmosphere, comput by CHANDRASEKHAR's method with the effects of multiple scattering and of the Lambe ground reflection included. The deviations of the measured values from the theoretical on were found to increase with increasing wavelength, as a consequence of scattering by larg aerosol particles. The large variety of these deviations suggests the possibility of a uniqu determination of several parameters defining different models regarding the size distribution aerosol particles. All preparatory work for the computation of the theoretical values of sk light polarization in a *turbid* atmosphere has now been completed so that this computatio can be the first task under the forthcoming contract. *Subject Headings:* **1. Sky light polarizatio 2. Photoelectric polarimeters 3. Rayleigh atmosphere.**—*Author's abstract.*

7.10–289 551.594.1

†Israël, Hans, **Die atmosphärische Elektrizität im Rahmen der Meteorologie. (Problem und Methoden der luftelektrischen Forschung und ihre Bedeutung für den Wetterdienst**

The place of atmospheric electricity in meteorology: problems and methods of atmospheric electric observation and its importance for the Weather Service.] *Meteorologische Rundschau*, Berlin, 9(5/6):80–84, May/June **1956.** 4 figs., 25 refs. **DLC**—The importance of atmospheric electricity to meteorology is threefold. Weather is always accompanied by electrical effects. Potential gradient, vertical current and conductivity in the Alps are compared with aerosol distribution, as shown by synoptic studies. Sferics are related to the pre-thunder stage and observations should be resumed in Germany. Radioactivity of the atmosphere is of practical interest in austausch problems, especially since atomic explosions began. Measurements in U.S.A. suggest that artificial radioactivity may rival natural radioactivity, and suggestions are made for warnings and investigations. *Subject Headings:* **1. Atmospheric electricity effects 2. Atomic explosion effects.**—*C.E.P.B.*

7.10–290 551.594.13

Norinder, H. and Siksna, R. (*Inst. for High Tension Research, Univ. of Uppsala, Sweden*), **Mobility of atmospheric small ions during summer nights at Uppsala.** *Journal of Atmospheric and Terrestrial Physics*, London, 4(4, i.e. 3):93–105, **1953.** 5 figs., 25 refs., eqs. **DWB**—A method involving the periodic alternation of limiting mobilities of a simple aspiration condenser has been employed to obtain characteristics of the number of atmospheric small ions captured during suitable weather conditions. The distributions of ions with respect to mobilities were computed. The structure of the distribution function varied with time. The idea is discussed that ions which are commonly called atmospheric small ions consist of two groups: small ions proper or cluster ions with mobilities between 1.5–2.5 cm $sec^{-1}$ volt $cm^{-1}$, and affected small ions with mobilities $(0.3+0.5)-(1\div1.5)$ cm $sec^{-1}$/volt $cm^{-1}$. Confusions which have hitherto existed concerning the mobilities of atmospheric small ions could be obviated by this conception. It is therefore of interest to investigate atmospheric small ions under the conditions which exist in the atmosphere, i.e., together with the factors which affect the pure small ions. Results obtained up till now have been encouraging, in spite of measuring difficulties caused by the irregular variations of the ionic concentrations investigated. *Subject Headings:* **1. Ion mobility 2. Small ions 3. Uppsala, Sweden.**—*Authors' abstract.*

7.10–291 551.594.21:551.515.3

Gunn, Ross, **Electric field intensity at the ground under active thunderstorms and tornadoes.** *Journal of Meteorology*, 13(3):269–273, June **1956.** 3 figs., 3 refs. **DWB**—Electric field meters were installed in a network 9 mi apart in Kansas. Records during the passage of the thunderstorm and tornado through Oxford and Udall on 25 May 1955 are reproduced. In the early stages the field built slowly towards negative values and recovered discontinuously to positive values by lightning flashes. Near the funnel the fluctuations were very rapid but smaller, with a flash every 5 sec. Electrically the tornado resembled a very active thunderstorm. *Subject Headings:* **1. Thunderstorm electricity 2. Tornado electricity 3. Kansas.**—*C.E.P.B.*

7.10–292 551.594.22:313.1

Malkowski, G., **Funkstörungen und Verkehrsunfälle.** [Sferics and traffic accidents.] *Meteorologische Rundschau*, Berlin, 9(5/6):109, May/June **1956.** 2 refs. **DLC**—The supposed relation between electrical disturbances and accidents is criticized because the receiver is often remote from the large town to which the accident statistics refer, or if it is in the town, it is affected by disturbances from motors not fitted with suppressors. Even if an effect of natural impulses can be shown, it may be due to action on the machines and not on men. *Subject Headings:* **1. Electrical discharge effects 2. Accidents.**—*C.E.P.B.*

7.10–293 551.594.222

**St. Elmo's fire [in] Ligurian Sea.** *Marine Observer*, London, 26(172):81, April **1956.** **DLC**—April 16, 1955, balls of light about 2 ft apart all along the ship's main aerial; heavy wireless interference. Just before disappearing all the balls ran along the aerial making a series of sparks as each one ran into the next. *Subject Headings:* **1. St. Elmo's fire 2. Ligurian Sea.**—*C.E.P.B.*

7.10–294 551.594.

Margs, Bruno, **Kugelblitz.** [Ball lightning.] *Meteorologische Rundschau*, Ber 9(3/4):72, March/April **1956. DLC**—A remarkable description of a fireball, diameter 25 cm, which came rapidly through the window and struck a girl, who felt no heat. There was detonation. *Subject Heading:* **1. Ball lightning.**—*C.E.P.B.*

7.10–295 551.594.

Teich, M., **Eine Kugelblitzbeobachtung.** [A ball lightning observation.] *Zeitsch für Meteorologie*, Berlin, 9(11/12):379, Nov./Dec. **1955.** fig. **DWB**—After a slight thund storm on Aug. 10, 1955, 6 km NE of Eichsfeld, a sphere as big as a football spiralled slow down and exploded; the observer was unconscious for a short time. Two other flashes ground occurred at the same time. *Subject Headings:* **1. Ball lightning 2. Eichsfeld, Germa** —*C.E.P.B.*

7.10–296 551.594.25:551.57

Gunn, Ross, **The hyperelectrification of raindrops by atmospheric electric fields.** *Jou of Meteorology*, 13(3):283–288, June **1956.** 2 figs., 12 refs., 17 eqs. **DWB**—The role of mospheric electric fields in selectively charging raindrops is analyzed and compared with dir measurements made inside an active thunderstorm. Expressions are developed for the f charge transferred to conducting spheres polarized by an electric field and immersed in environment in which the positive and negative ionic conductivities are different. Measu ments in a wind tunnel operating with ionized air confirm the analysis. Because the electri conductivities inside a cloud and in the clear air immediately outside are so very differe electric fields acting across such a cloud boundary selectively concentrate ions of a single s in a space-charge layer. Extensive regions are thereby established wherein the positive a negative ionic conductivities are notably different. Cloud and raindrops in this transiti layer become hyperelectrified. Expressions for the mean space charge in the transition la are developed. The estimated drop charges and space-charge densities are found to agr with earlier measurements made at various levels inside an active thunderstorm. It is fou that a large fraction of the free space charge inside a thundercloud is carried by the precipitati and is roughly proportional to the electric field intensity within the cloud-boundary transiti layer. Since transition layers near the cloud boundaries play an important part in the el trification process, precipitating cumulus-type clouds developing in a clear-air environme are most likely to produce active lightning. *Subject Heading:* **1. Electrical charges on rai drops.**—*Author's abstract.*

## AURORAS

*See also:* **Photometric unit for airglow, aurora** (Hunten et al.), 7.10–67; **Auroral echoes** (Dyce), 7.10–70; **Investigations of aurora** (McNamara), 7.10–71.

7.10–297 551.594.5:551.501.81 551.594.12:550.

Booker, H. G., **A theory of scattering by nonisotropic irregularities with application radar reflections from the aurora.** *Journal of Atmospheric and Terrestrial Physics*, Londo 8(4/5):204–221, May **1956.** 4 figs., 14 refs., 48 eqs. **DWB**—Radar echoes from auro come mainly at low elevations from north, even at stations north of auroral visual zon Horizontal and vertical extent of echoes increase as frequency decreases from 100–25 Mc/ An explanation is given in terms of columns of ionization parallel to earth's magnetic field, b only about 40 m long by 1 m diameter, probably too small to be associated with visible ray These irregularities are of the same order of size as turbulence elements and it is suggeste that the magnetic field creates nonisotropic irregularities of electron density in the E regio with maxima some 100 times the normal, but this cannot explain fading of auroral echoes which must be due to other features of auroral ionization. *Subject Headings:* **1. Radar echoe from aurora 2. Geomagnetic effects on ionization.**—*C.E.P.B.*

7.10–298 551.594.

Chamberlain, Joseph W., **Auroral rays as electric-discharge phenomena.** *Astrophysic Journal*, Chicago, 122(2):349–350, Sept. **1955.** 3 refs. **DLC**—Nearly constant luminosity

uroral rays over a large height and density range requires a compensatory mechanism which is ot fully understood. Excitation could increase with height due to greater incident energy, nd the number of collisions decrease with height due to decreasing density. A current density f $6\times10^{12}$ electrons/cm² sec would be necessary for a ray $10^4$ cm in diameter. An electron ensity of $10^6$ cm$^{-3}$ would be postulated for the lower part of the ray (in arcs $10^8$ electrons/cm³). he current density is uncertain because the diameter of rays is uncertain. The theory dvanced by author balances the electron and proton influx and penetration against the onductivity in the layers where the arcs form and leads to the conclusion that the electron ay be accelerated downward by the pull of the protons and that when arcs recede the rays re left in position originally occupied by the latter. *Subject Heading:* **1. Auroral ray luminosity.**—*M.R.*

7.10–299 551.594.5(02)

Thomsen, I. L., **Manual for visual observations of the Aurora Australis.** *Wellington ew Zealand. Carter Observatory, Astronomical Bulletin,* No. 29, June **1949.** 25 figs. (incl. orms). **DWB**—A most complete instruction or reference manual for auroral observations in ew Zealand. It includes chapters on historical and theoretical aspects of auroras, networks f voluntary observers, types of reporting, false indications of aurora, auroral forms, timing, ethod of reporting, bearings and altitudes, instruments (home made and professional), ements to measure, recording, star references, auroral drawings, ship reporting, photography nd, finally, applications, etc. *Subject Headings:* **1. Auroral observation 2. Aurora australis 3. Aurora manuals.**—*M.R.*

7.10–300 551.594.51:546.11

†Vegard, L. and Kvifte, G., **Theory and observations of the enhancement of auroral ydrogen lines with increasing distance from the magnetic axis point.** *Geofysiske Publikasoner,* Oslo, 19(2), **1954.** 10 p. 5 tables, plate, 26 refs. Price: 3.00 Kr. **DWB, DLC**—wenty-six spectrographs are shown. The intensity of the Hp line at Oslo is more than 6 mes greater than at Tromsö. The increase of magnetic stiffness with increasing proton elocity might be a cause of this effect. The new results are in some disagreement with the assical Birkeland-Störmer theory. *Subject Headings:* **1. Auroral hydrogen lines 2. Birkeland-Störmer theory 3. Oslo, Norway 4. Tromsö, Norway.**—*A.A.*

7.10–301 551.594.52

Currie, B. W. **Auroral heights over west-central Canada.** *Canadian Journal of Physics,* ttawa, 33(12):773–779, Dec. **1955.** 2 figs., 2 tables, 11 refs. **DWB, DLC**—A complete alysis of the parallactic photographs of aurora taken at Chesterfield, N.W.T. (63.3°N, 0.7°W) in 1933 show (a) a marked maximum in the heights of the lower limits of both homoeneous arcs and bands and auroral structures with rays between 100 and 110 km, (b) a mean eight of the lower limit of arcs and bands of 108.2 km, (c) a mean height of the lower limit of uroral structures with rays of 113.4 km, (d) a decrease of height with increasing intensity and e) no definite evidence of a change of height with time after sunset. The results suggest that eights of aurora as observed from northern Canada are slightly higher than of aurora obrved from Norway. This may be due to the locations of the two regions relative to the zone maximum auroral occurrence. No exceptionally low heights were observed at Chesterfield. emeasurements of the 1933 photographs for Saskatoon (52.1°N, 106.6°W) indicate that one rc was definitely below the 70-km level, and possibly below the 60-km level. *Subject Headgs:* **1. Auroral heights 2. Chesterfield, Canada.**—*Author's abstract.*

7.10–302 551.594.52:523.74

Meinel, A. B.; Negaard, B. J. and Chamberlain, J. W., **Variation of the 27-day recurrence eriod for low-latitude aurorae.** Chicago. Univ. Yerkes Observatory, Williams Bay, Visc., Contract AF 19(122)-480, Technical Report, No. 14, July 29, **1955.** 4 p. 2 figs.— n earlier statistical study of the recurrence periods of low-latitude auroras has been extended an attempt to ascertain any variations in the solar-rotation (27-day) recurrence period rough the solar cycle. The data are divided according to minimum and maximum years d according to the first and second halves of the solar cycles. Some changes during the

cycle are suggested by the data, but an insufficient number of observations are available make any conclusions definite. *Subject Headings:* **1. Low latitude auroras 2. Auroral-sol relationships.**—*A.A.*

7.10–303 551.594.

*Sandner, Werner, **Häufigkeit und Periode der Nordlichterscheinungen auf Island ur den Faer Oern.** [Frequency and period of the aurora in Iceland and the Faeroe Islands *Polarforschung Kiel*, Ser. 3, 22(1/2):185–187, **1952,** pub. Aug. 15, 1954. tables. **DWB** The analysis is based on a 30-yr (1893–1922) unbroken observational record of the phenomen at 2 observation points in Iceland (Grimsey, 66°24′N and Vestmano 63°26′N) and 36 yrs da (1900–1935) at Thorshaven on the Faeroes (62°2.5′N). The results show: a) the mean year number of days with auroras, b) the earliest and c) latest dates of aurorae during the peri accounted for, d) the longest continuous series of days with auroras, e) the number of da with auroras in every individual year of the period and f) the annual variation of auro frequency calculated from the mean monthly number of days with aurora. It has be observed that a minimum of frequency occurs in mid-winter and a maximum at the time of t solstices. Further, that the peculiarity of illumination conditions in the Arctic produces more clear aurora in the moderate latitudes, than in high latitudes. *Subject Headings:* **1. Au roral frequencies 2. Auroral data 3. Iceland 4. Faeroes.**—*A.M.P.*

## SFERICS AND RADIO METEOROLOGY

*See also:* **Cosmic-ray observations** (Cranshaw et al.), 7.10–1; **Sporadic echoes from E region** (Lovell), 7.10–135; **Transient echoes from ionosphere** (Lovell), 7.10–135; **Focusing on a "rippled" ionosphere** (Rawer), 7.10–138; **Decrease in low-frequency atmos. noise** (McKerrow), 7.10–175.

7.10–304 551.594

Ellis, G. R., **On the propagation of whistling atmospherics.** *Journal of Atmospher and Terrestrial Physics*, London, 8(6):338–344, June **1956.** 6 figs., 2 refs., 13 eqs. **DWB**— It is shown that the dispersion of whistling atmospherics propagated along the lines of force the earth's magnetic field should be greatly dependent on the geomagnetic latitude of t observing point. The change in the magnetic-field intensity along a line of force produces a upper-frequency limit for whistler propagation which, at latitudes greater than 62°, shou fall within the usually observed frequency region of 1–10 kc/s. Dispersion curves showin this critical frequency are given for geomagnetic latitudes 55°, 60°, and 65°. *Subject Headin* **1. Sferics propagation.**—*Author's abstract.*

7.10–305 551.594.7:621.396.9(2

Brocks, Karl, **Der Brechungsindexgradient für elektromagnetische Wellen (Cm- bi M-Band) in der maritimen Grenzschicht der Atmosphäre.** [The gradient of refractive inde for electromagnetic waves (cm- to m-band) in the maritime boundary layer of the atmosphere. *Deutsche Hydrographische Zeitschrift*, 8(5):186–194, **1955.** 4 figs., 3 tables, 9 refs., 18 eq German, English and French summaries p. 186–187. **DWB**—The vertical gradient of th modified refractive index is correlated with the air-water temperature difference and th vertical stratification of water vapor. These correlations enable the mean vertical gradien of refractive index in the duct in the lower decameters above the sea surface to be calculated Tables and diagrams are given for practical application, with values for summer and winte at Weather Ship D as an example. *Subject Heading:* **1. Refraction of electromagnetic waves** —*C.E.P.B.*

7.10–306 551.594.7:523.7

*Lindquist, R., **Ionospheric effects of solar flares: preliminary reports Nos. 2 and 3** *Göteborg, Sweden, Chalmers Tekniska Högskola, Handlingar*, No. 95, **1950.** 11 p. diagrs., tables. *Reports from the Research Laboratory of Electronics*, No. 13. **DWB**—Results of fade out recordings made at the Ionospheric and Radio-wave Propagation Observatories at Gothen

burg, Sweden from July 1948–June 1949 are presented in tables and graphs. *Subject Headings:* **1. Radio fading 2. Solar flare effects 3. Gothenburg, Sweden.**—*M.R.*

7.10–307 551.594.7:621.396.11

Schumann, Winfried Otto (*Elektrophysikalisches Inst. T.H. Munich*), **Über die Ausbreitung langer elektrischer Wellen um die Erde und einige Anwendungen auf Senderinterferenzen und Blitzsignale.** [Propagation of long electric waves round the earth and some applications to transmitter interferences and lightning signals.] *Zeitschrift für angewandte Physik*, Berlin, 6(8):346–352, **1954.** figs., 22 refs., eqs. **DLC**—Interferences of long wave transmitters, atmospheric processes, lightning discharges, atmospherics and reflected impulses are first discussed. Conditions for long wave propagation are well-known but the problem of propagation of electric waves in the atmosphere is still not well understood. On the one hand, it is necessary to study the very small conductivity of the ionosphere during signals of the "slow tail" type in order to understand the important fading, while signals consisting of a long series of reflected impulses require especially good reflection properties, i.e., high conductivity of the ionosphere and different reflection heights. The kind of wave types which is received meteorologically is to a large extent still unknown and should be analyzed in detail. *Subject Headings:* **1. Ionospheric reflection 2. Radio wave propagation 3. Lightning discharges.**—*A.M.P.*

7.10–308 551.594.7:621.396.8:523.8

Wright, R. W.; Koster, J. R. and Skinner, N. J., **Spread F-layer echoes and radio-star scintillation.** *Journal of Atmospheric and Terrestrial Physics*, London, 8(4/5):240–246, May **1956.** 4 figs., 10 refs. **DWB**—Observations of radio-star scintillation at Achimota and spread F layer scatter at Ibadan, both in Gold Coast, 510 km apart, showed an average correlation of 0.46 for 165 pairs. Diurnal and seasonal variations of spread F layers are plotted. These depend to some extent on the degree of magnetic disturbance; at Ibadan in winter the scatter on disturbed days is only a quarter that on quiet days. *Subject Headings:* **1. F layer scattering 2. Radio star scintillation 3. Gold Coast.**—*C.E.P.B.*

# PART II. ANNOTATED BIBLIOGRAPHY ON TROPICAL CYCLONE EFFECTS

By: *Geza Thuronyi*

## INTRODUCTION

This is the second in a series of hurricane bibliographies prepared for, and with support from t U. S. Weather Bureau. The first, published in the last (September 1956) issue, covered literat dealing with the general aspects of tropical cyclones. The present bibliography is concerned w practical aspects of hurricane research, reconnaissance, warning, rescue and relief activities and w various phenomena associated with tropical storms: tidal waves, swell, wind waves, microseism sferics, wind pressure, rainfall, floods, damage caused by such phenomena and their use in locati tracking and predicting storms.

Important literature of the past century was reviewed in the first bibliography; emphasis this one is on recent publications.

It might have been appropriate to include many of the reports on hurricane effects appear in the newspapers or magazines. However, a partial list (see 7J–41) of literature on a single hur cane (the New England Hurricane of September 21, 1938) contains 83 references and a simi coverage may be assumed to be available for other notable storms; hence it was not consider practicable to give more than occasional references to such popular literature.

Several items in the first bibliography are applicable to our present subject; a few of these a repeated herein. Others will be found under the numbers 7I–45, –56, –71, –77, –81, –90, –94, –9 –104 to 107, –122, –142, –151, –154, –168, –182, –189. Other pertinent material is contained in c earlier bibliographies on **Wind waves and swell** (*MAB*, Nov. 1954) and on **Storm surges** (*MA* March 1955).

Case histories of individual storms have been reserved for future bibliographies and are includ here only if they are of interest from the point of view of storm location, warning, damage, relief other practical aspects.

The third bibliography in this series, to be published in the next issue of *MAB* will cover t detailed or specific articles on theory and analysis of tropical cyclones.

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### 1866–1898

**7J–1** 551.515.2(54

Gastrell, J. E. and Blanford, Henry F., **Report on the Calcutta cyclone of the 5th October 18** Calcutta, O. T. Cutter Military Orphan Press, **1866.** 150 p. 3 + 7 charts (fold.), numerous tabl **DWB**—This volume contains the complete history of the Calcutta cyclone of 1864 with detail meteorological description and records. On p. 109–124 a full discussion of the storm wave is giv including data on its height at various points and specification of the areas affected. Lists of dama to life and property are added. Loss of life is put close to 50,000, and another 25,000 to 30,0 deaths by sickness in the storm-swept districts are in a great part attributed to indirect effects the storm. *Subject Headings:* **1. Cyclone, Calcutta** (1864) **2. Hurricane damage 3. Calcut India.**—*G.T.*

**7J–2** 551.515.2:551.46

Bridet, M., **Étude sur les ouragans de l'hémisphere austral.** [Hurricanes of the Southe Hemisphere.] 2nd rev. ed. Paris, Adolphe Laine, **1869.** 265 p. 53 figs., tables. **DWB**— this excellent text written by a mariner for mariners the laws of hurricane movement in the Southe

misphere and maneuvers of ships on various routes are discussed in detail. The development of ell and storm surges on Réunion Island during the approach and passage of hurricanes is discussed pages 173, 179–181 and 224–234, including several examples of surges observed in connection h individual hurricanes, close or distant. Torrential rain and floods connected with hurricanes also discussed (p. 235–237). *Subject Headings:* **1. Southern Hemisphere hurricanes 2. Hurri-ne tides.**—*G.T.*

**7J–3** 551.515.2(75)

Harris, Joel Chandler, **The Sea Island hurricanes.** *Scribner's Magazine*, N. Y., 15(2,3):229–7; 267–284, Feb., March **1894.** illus. **DLC, DWB**—Results of an investigation into the situation on the Sea Islands of the south Atlantic coast of the U. S. by a hurricane in Aug. 1893 are re-rted with an urgent appeal for help to the people in distress. A hurricane which affected the uisiana and Mississippi coasts in Oct. of the same year is also briefly described. This latter rricane is stated to have claimed a death toll of some 2000 persons, mostly the aged, the very ung and the infirm. Hundreds were found without wounds, "killed by the sheer pressure and y of the wind" or "nervous collapse." The beautiful drawings by Daniel Smith show scenes of on the Islands. *Subject Headings:* **1. Hurricane damage 2. Hurricane, Sea Islands (1893) Sea Islands, Atlantic Coast of United States.**—*G.T.*

**7J–4** 551.515.2(914)

Algué, José, **El baguio de Samar y Leyte 12–13 de Octubre de 1897.** [The Samar and Leyte guio of Oct. 12–13, 1897.] Manila, J. Marty, **1898.** 74 p. figs., tables, photos. **DWB**—The rmation and development of a hurricane which affected the Philippine Islands (Samar and Leyte) Oct. 1897, its meteorological characteristics, movement and destructive effects are discussed and ustrated. Three chapters (p. 9–38) deal with the theory of hurricane swell and the storm surge servations made during the hurricane at different points of the islands. Tidal waves over 7 m gh were observed; pressure of such masses of water is calculated in terms of height above mean l level and velocity of translation as derived from the velocity of movement of the cyclone. *Subject eadings:* **1. Hurricane case histories 2. Baguios, Philippine Islands (1897) 3. Philippine Islands.** *G.T.*

## 1900–1906

**7J–5** 551.515.2(764):551.461.2

Garriot, E. G., **West Indian hurricane of Sept. 1–12, 1900.** *Monthly Weather Review*, Wash., C., 28(9):371–377, Sept. **1900.** fig., table. Includes, p. 372–374, Cline, Isaac M., **Special report the Galveston hurricane of Sept. 8, 1900. DLC**—In terms of life and property losses (6000 led, $30 million estimated damage) the hurricane which hit Galveston, Texas, on Sept. 8, 1900 s the worst on record. CLINE's account is an eye witness report by the official in charge of the eather Bureau Office. Weather Bureau storm warnings are stated to have successfully protected ps in the area. *Subject Headings:* **1. Hurricane tide damage 2. Hurricane, Galveston (1900) Galveston, Texas.**—*G.T.*

**7J–6** 551.515.2(764)

Lester, Paul, **The great Galveston disaster, containing a full and thrilling account of the ost appalling calamity of modern times.** Introd. by Richard Spillane. [Galveston?], **1900.** 6 p. photos. Also: Coulter, John (*ed.*), **Complete story of the Galveston horror, written by the rvivors.** [Chic., J. H. Moore & Co.], **1900.** 386 p. photos. Also: Halstead, Murat, **Galveston: e horrors of a stricken city.** [Chic.], American Publishers' Association, **1900.** 368 p. photos. so: Ousley, Clarence (*ed.*), **Galveston in nineteen hundred.** Atlanta, Ga., William C. Chase, **00.** 346 p. photos. Also: American National Red Cross, **Report of Red Cross relief, Galveston, xas.** Wash., D. C., **1900 1901.** 95 p. photos, map. Also: **Album of Galveston the day before d the day after the great storm.** [Galveston], W. W. Dexter and the Galveston Tribune [1900]. p. entirely photographs. Newspaper clippings in pocket. **DLC**—The horrors of destruction Galveston on Sept. 8, 1900 are vividly depicted and shown in photographs. The first three books nsist chiefly of accounts by survivors including officials in charge of rescue, welfare, security and her operations. Details of the hurricane, its magnitude and probability of recurrence are also scussed. Lists of identified victims are appended to the first and second book. The fourth lume (Ousley) was published for the benefit of Galveston public schools. It contains a detailed story of the development of the city of Galveston, its buildings and its economic life, with particular tention to the destruction caused by the hurricane. The Red Cross account is a collection of ports and correspondence connected with the extensive relief activities in Galveston. *Subject eadings:* **1. Hurricane, Galveston (1900) 2. Galveston, Tex.**—*G.T.*

7J–7 551.515.2(512.

**The calamitous typhoon at Hongkong, 18th September, 1906, being a full account of the disas**
Hong Kong, The "Hongkong Daily Press" Office, **1906.** 20 p. 18 photos. **DWB**—Most of
report deals with damage to ships in Hong Kong and Kowloon harbors, examples of which
shown in photographs. Much of the disaster was due to the lack of early warning by the H
Kong Observatory. In connection with an official inquiry into this matter it is suggested that
of cooperation with other observatories may be responsible for inefficiency of the warning ser
*Subject Headings:* **1. Hurricane damage 2. Typhoon, Hong Kong (1906) 3. Hong Kong.**—*G.T.*

## 1918–1920

7J–8 551.515.2(52):551.4

*Nakamura, Saemon Taro, **Investigation of a "Tsunami" in Tokyo Bay.** *Japan. Cen*
*Meteorological Observatory, Occasional Report* [*Kisho Zassan*], 1:189–210, **1918.** Also his: **Forec**
**ing the storm tides of Tokyo Bay.** *Ibid.*, p. 278–282. Both in Japanese. **MH-BH**—The amplit
of the storm tides produced by every 1 mm Hg decrease in pressure of the typhoon center as a funct
of the translation speed $v$ of the typhoon was studied for Tokyo Bay and it was found to attain
maximum value at about $v = 50$ km/hr. It is connected with the resonance transfer of energy f
typhoons to the storm waves on the surface of Tokyo Bay. Curves show relationships betw
maximum wind speed at Tokyo and height of storm tide (non-linear); and between speed of mo
ment of typhoon center and height of tide, respectively. *Subject Headings:* **1. Storm tides 2. Sto**
**surge forecasting 3. Typhoon waves 4. Tsunamis 5. Tokyo Bay, Japan.**—*H. Arakawa.*

7J–9 551.515.2(764):551.46

Bartlett, Terrell, **The tidal storm at Corpus Christi and the effects on engineering structur**
*Engineering News Record*, New York, 83(19):848–852, Nov. 13–20, **1919.** map, photos. **DLC**
Detailed illustrated account of damage suffered by various types of structures in Corpus Chri
Texas, on Sept. 14, 1919 from a West Indian hurricane. Although the hurricane was one of moder
force it produced a tidal wave 12.4 ft above mean low tide, which passed over the barrier isla
formerly relied upon for safe protection. *Subject Headings:* **1. Hurricane tides 2. Tidal wa**
**3. Hurricane damage 4. Hurricane, Corpus Christi (1919) 4. Corpus Christi, Texas.**—*G.T.*

7J–10 551.515.2:551.461.2(263.4):551.509

Cline, Isaac Monroe, **Relation of change in storm tides on the coast of the Gulf of Mexico**
**the center and movement of hurricanes.** *Monthly Weather Review*, 48:127–146, **1920.** 9 figs.,
refs. Reprinted in *Louisiana Engineering Society, Proceedings*, 6(5):200–256, Oct. **1920.** Al
Dunn, H. H., **Forecasting the path of hurricanes on the Gulf of Mexico by tides.** *Popular Mechana*
35(3):377–381, March **1921.** illus. **DLC**—From observations of tides connected with hurrican
in the Gulf of Mexico, numerous circumstantial examples of which are given in this paper, a mec
anism of hurricane swell is derived. According to this theory the biggest waves are generated in t
right rear quadrant of the storm, where the wind direction often coincides with the line of advan
The waves pass through the cyclone area and reach the shore one or two days ahead of the hurrican
Changes in the position of the rise of storm tide indicate changes in the course of the storm. Du
quotes the conclusions contained in CLINE's paper, discusses their importance as a method of hur
cane forecasting and reports that forecasting and warning based on this method of tidal computati
is already in use along the Gulf of Mexico. *Subject Headings:* **1. Hurricane tides 2. Hurrica**
**forecasting 3. Gulf of Mexico.**—*G.T.*

## 1925

7J–11 551.515.2(265/266,267,26

*†Fischer, Norbert, **Die wirtschaftlichen Schäden der tropischen Wirbelstürme. Eine wirtschaf**
**geographische Untersuchung zur Frage der Wirtschaftsinstabilität infolge von Wetterschäde**
[Economic loss due to tropical cyclones: an economic-geographical investigation into the instabili
of economy as a function of weather damage.] *Aus dem Archiv der Deutschen Seewarte*, Hambur
**43(1), 1925.** 54 p. tables, 137 refs. **DLC**—Contents include discussion of tropical cyclones
general, their extent, characteristics, tracks, factors causing damage, etc.; their distribution
east Asia and Pacific regions, as well as in Indian and Atlantic Oceans; the extent, type and econom
significance of damage caused by them. Map of world shows extent and intensity of distributio
Some of the worst typhoons and hurricanes are listed by regions with very brief notes on dama
caused by them. (*Same item as* 7I-34, Sept. 1956, *MAB.*) *Subject Headings:* **1. Hurricane dama**
**2. Tropical cyclone distribution 3. Pacific Ocean 4. Indian Ocean 5. Atlantic Ocean.**—*H.*
*Kramer.*

**7J–12** 551.515.2

Visher, Stephen S., **Some effects of tropical cyclones.** *Journal of Geography*, 24(4):139–150, pril **1925.** 5 figs. **DLC**—Damage-causing factors in tropical cyclones (wind, waves and rain) e discussed qualitatively. Several practical suggestions are offered for reducing damage to planta-ns, coastal cities and ships. *Subject Heading:* **1. Tropical cyclone damage.**—*G.T.*

**7J–13** 551.515.2:591.9

Visher, Stephen S., **Tropical cyclones and the dispersal of life from island to island in the cific.** *American Naturalist*, 59:313–319, Jan./Feb. **1925.** foot-refs. **DWB, DLC**—Advances guments in support of the theory that tropical cyclones had a major part in populating the Pacific ands. Birds and insects and various forms of life attached to leaves are often carried over long stances by cyclone winds; floods and ocean currents connected with tropical cyclones are also fective in carrying animal life. *Subject Heading:* **1. Hurricane effects on animal dispersal.**—*G.T.*

1926

**7J–14** 551.515.2(759):551.556.1:699.83

Beerbower, George M., **Hurricane effects on buildings at Hollywood, Florida.** *Engineering ews Record.*, New York, 97(19):752, Nov. 4, **1926.** Also: Fletcher, L. F., **Florida hurricane damage seen by a building official.** *Ibid.*, 98(7):281–282, Feb. 17, **1927. DLC**—Beerbower reports nstruction weaknesses revealed by damage on minor structures caused by a hurricane on Sept. 18, 26 at Hollywood, Fla. Roof and wall failures are found to result from lack of anchoring. Fletcher discusses damage by the same hurricane to various types of structures such as frame con-uctions, brick, concrete block, tile, parapets and curtain walls, reinforced concrete, steel frame, ofs and windows. Design for 30 lb pressure in severe storm areas is considered desirable instead the 20 lb requirement currently in practice. *Subject Headings:* **1. Hurricane wind damage 2. Hur-ane, Hollywood, Fla. (1926) 3. Hollywood, Fla.**—*G.T.*

**7J–15** 551.515.2:551.556.1(759)

Boyer, H. B., **Destructive gust at Jupiter, Fla., following the Miami hurricane.** *Monthly eather Review*, 54(10):416, Oct. **1926. DWB**—Note reporting a gust of hurricane force, having ell defined, narrow path (400 ft wide), which occurred during recrudescence of hurricane after ssage of center, causing considerable damage. *Subject Headings:* **1. Hurricane wind damage Jupiter, Fla.**—*G.T.*

**7J–16** 551.515.2(759)

Reese, Joe Hugh, **Florida's great hurricane.** Miami, Lysle E. Fesler, **1926.** 93 p. 2 figs., merous photos., table. **DWB**—In this pictorial and textual account of the passage of a destructive rricane through Miami, Fla., on Sept. 17–18, 1926, details of meteorological development, damage various structures, experiences of individuals and relief and rehabilitation measures are given. *ubject Headings:* **1. Hurricane, Miami (1926) 2, Miami, Fla.**—*G.T.*

1927

**7J–17** 551.515.2

Fischer, Norbert (*Rostock Univ.*), **Die tropischen Wirbelstürme und das Wirtschaftsleben des enschen.** [Tropical cyclones and man's economy.] *Materiaux pour l'Étude des Calamités*, eneva, 3(12):283–299, **1927.** tables, 4 refs. **DWB**—Properties of tropical cyclones and their ographic and seasonal distribution are discussed. Destructive factors are described, namely: nd (table giving wind speeds and corresponding wind pressures), tidal waves and flood rainfall xamples quoted). Relative importance of damage to the various branches of economy is examined talitatively (agriculture, structures, ships, etc.), damage to agriculture being considered the most rious. To reduce tropical storm damage (a) research on the causes of storms, (b) intensification storm warning services and (c) stronger public participation in the restoration of property are commended. *Subject Heading:* **1. Tropical cyclone damage.**—*G.T.*

**7J–18** 551.515.2:551.461.2

Tannehill, Ivan Ray, **Some inundations attending tropical cyclones.** *Monthly Weather Review*, (10):453–456, Oct. **1927.** fig., 6 refs. **DLC**—An explanation is advanced for the sudden storm aves which caused incalculable damage during certain hurricanes. According to the proposed echanism the water follows the hurricane's circular movement to a considerable depth; it ac-mulates near the shore line; near the center this accumulation is relieved by a swift current along e shore; after the passage of the center over the shore line this current is met by the winds in the ar of the cyclone, causing the sudden destructive tide. *Subject Headings:* **1. Hurricane damage Hurricane tides.**—*G.T.*

## 1928

**7J–19** 551.515.2(759):551.556.1:6

Balcom, H. G.; Coyle, D. C.; McMillan, F. R. et al., **Final report of the Committee o Structural Division on Florida hurricane.** *American Society of Civil Engineers. Proceedings*, 54(6):1757–1765, Aug. **1928.** 5 figs. Also: Bangs, Nesbitt H., **Effect of the 1926 Florida hurri upon engineer designed buildings.** *American Meteorological Society. Bulletin*, 10(2):46 47, **1929. DLC**—Damage caused by the Florida hurricane of Sept. 17 and 18, 1926, especially to buildings (Meyer-Kiser Bldg. and Realty Board Bldg.) is described in detail with diagrams structures involved. Structural causes of failure are discussed. Some evidence appeared to su the occurrence of wind pressures over 50 and as high as 65 lb per sq ft, but "all the tall buil consistently designed for a wind load of 20 lb per sq ft survived without serious damage." *Su Headings:* **1. Hurricane damage 2. Wind damage to buildings 3. Hurricane, Florida 4. Florida. I. Miller, Lee H. II. Morris, Clyde T.**—*G.T.*

## 1930

**7J–20** 551.509.52:551.5

Sarasola, Simon, **Movimientos del mar en los ciclones: su importancia en la previsión.** [M ments of the sea in cyclones: their importance in forecasting.] (In his: **Los huracanes en Antillas.** Madrid, **1928.** p. 73–79.) Reprinted as: *Cuba. Marina de Guerra, Boletin Hidrogr* No. 102–103, March 25–April 10, **1930.** Article appears on reverse side of the two single-s bulletins. foot-ref. **DWB**—Knowledge on the propagation of hurricane swell is summed several authorities on the subject (Viñes, Cline, Froc, etc.) are quoted. The fact that swell ginating in a tropical cyclone propagates to distances over 400 mi, is suggested as evidence usefulness in storm forecasting. (For an abstract of the book, *see* 7I–192, Sept. 1956, *M Subject Headings:* **1. Hurricane forecasting 2. Hurricane swell.**—*G.T.*

## 1931

**7J–21** 551.515.2(72

Messerly, Oscar, **Le cyclone de Saint-Domingue en septembre 1930.** [The Santo Dom cyclone of September 1930.] *Matériaux pour l'Étude des Calamités*, Geneva, 7(25):35–42, 1 2 figs. Also his: **Le cyclone de Camaguey (Cuba).** [The Camagüey (Cuba) cyclone.] *I* 8(30/31):219–225, **1933.** map (fold.). **DWB**—Meteorological aspects of two destructive hurrica are discussed along with the measures taken by the authorities to warn the population and pre or minimize damage. In the Santo Domingo hurricane of Sept. 3, 1930, 90% of the buildings in city of Santo Domingo were destroyed, 2000 persons were killed, 8000 wounded and 30,000 homeless. The damage was estimated from 15 to 50 million dollars. Behind the city the hurri bounced off the "Cordillera Central" range and passed over Santiago without reaching down to ground, and causing no damage in that area. In the second paper the storm warning organiza of Cuba is described and the unwillingness of the population to pay prompt attention to warn is considered one of the most serious obstacles to effective protection. *Subject Headings:* **1. Hurric damage 2. Hurricane, Santo Domingo (1930) 3. Hurricane warning services 4. Cuba.**—*G.T.*

## 1933

**7J–22** 551.515.2(263.4):551.4

Cline, Isaac Monroe, **Tides and coastal currents developed by tropical cyclones** *Mon Weather Review*, 61(2):36–38, Feb. **1933. DWB**—"Storm tides which build up on the coast in right-hand front of a hurricane result from the storm swells from winds in the right rear quadra and are the storm's greatest destructive agency and outstanding indicators of its intensity direction of movement. Storm tides sometimes detected as much as three days in advance of storm. Historical instances cited. Destructive force of currents caused by storm swell and runn from left to right across the right front hurricane quadrant described. (*Same item as* 6C–25, Ma **1955,** *MAB.*) *Subject Headings:* **1. Hurricane tides 2. Gulf of Mexico.**—*M. P. Kramer.*

## 1934

**7J–23** 551.515.2:629.12(729,26

Boy-Ed, Emil, **Die Bedeutung von Orkanmeldungen auf See.** [The importance of hurric reports at sea.] *Der Seewart*, Hamburg, 3(2):65–71, **1934.** 4 figs. (fold.). Also his: **Meteo logischer Warndienst und Schiffssicherheitsvertrag.** [Meteorological warning service and treat on navigational safety.] *Ibid.*, 4(4):154–159, **1935.** fig. (fold.). **DLC**—Experience of ves in (1) two hurricanes around the West Indies and (2) a typhoon in the China Sea is describ Much confusion could have been avoided if a sufficient number of ships' reports on storm cen

sitions had been sent out to other ships and to meteorological services. Under the London eatise on Navigational Safety (1929), captains of ships are required to report details on tropical orms they encounter. *Subject Headings:* **1. Navigation in hurricanes 2. Hurricane warning rvices 3. West Indies 4. China Sea.**—*G.T.*

**7J-24** 551.515.2:551.461.2

*Gherzi, Ernesto, **Typhoons in 1932 (Note on the swell of cyclones).** [Shanghai], Tou-Se-We phanage Printing Press, **1934.** 30 p. tables, charts (fold.). At head of t-p: Zi-Ka-Wei Ob-rvatory. **DWB**—From a large number of wave period measurements made by the Indo China avigation Co. and the China Navigation Co., properties of cyclonic swell as opposed to monsoon aves are derived. Practical rules are offered for locating typhoon centers from swell activity. ertical pumping in the cyclone center is offered as a basic explanation of cyclonic swell but the istence of other mechanisms (such as perhaps a "wake" following the typhoon center) is recognized. his discussion of swell occupies one-third of the report (10 pages), the rest being devoted to routine counts of the storms of the year. *Subject Headings:* **1. Hurricane swell 2. Typhoon location om swell.** —*G.T.*

1935

**7J-25** 551.515.2(265.6):551.461.2:550.342

Bruzon, E., **Contribution a l'étude des variations du niveau de la mer et de l'agitation micro-ismique en relation avec le passage des typhons.** [Sea level variations and microseismic activity connection with the passage of typhoons.] *Annales de Physique du Globe de la France d'Outre Mer,* (10):105–108, 111, Aug. **1935.** 2 graphs, ref. **DLC**—Swell and microseisms observed at Phu Lien bservatory during the passage of a typhoon on Oct. 2 and 3, 1933, are discussed. The observations uggest the theory that microseisms are generated on the ocean bottom where it steeply rises near ie coast. If microseisms were generated directly below the storm there should be an interruption the microseismic record when the storm passes over an island; this was not the case when the yphoon passed over the Island of Hainan. *Subject Headings:* **1. Hurricane tides 2. Typhoon icroseisms 3. China Sea.**—*G.T.*

**7J-26** 551.509.5:551.515.2:06

Calvert, Edgar B., **The hurricane warning service and its reorganization.** *Monthly Weather eview,* 63:85–88, **1935.** Also in: *American Geophysical Union, Transactions,* 16:117–121, Aug. **935. DLC**—The history of hurricane warning is outlined. The reorganized U. S. Weather Bureau arning service (effective July 1, 1935) with centers at San Juan, New Orleans and Jacksonville is escribed and its methods of reporting and operation indicated. *Subject Heading:* **1. Hurricane arning services.** —*G.T.*

**7J-27** 551.515.2(691):551.461.2

De Martin de Vivies, P., **La houle et le niveau de la mer pendant le cyclone du 20 février 1935 Tamatave.** [Swell and sea level during the cyclone of Feb. 20, 1935 at Tamatave.] *Annales de hysique du Globe de la France d'Outre-Mer,* 2(10):102–103, 109, Oct. **1935.** diagr., photo, 2 refs. **LC**—Tidal wave activity at Tamatave during the passage of a tropical cyclone of medium intensity described. The maximum rise of the tidal level was 20–25 cm above normal. No effect of the yclone on sea level was found beyond 12 hours preceding and following the passage of the center. his fact rendered the tidal observations useless from the point of view of forecasting the storm. *ubject Headings:* 1. Hurricane tides 2. Tropical cyclone, Tamatave (1935) 3. Tamatave, Mada-iscar.—*G.T.*

**7J-28** 551.515.2(52):551.461.2

Hidaka, Koji, **Change of water level in an enclosed sea due to a temporary wind.** *Geophysical Magazine,* Tokyo, 9(3/4):279–284, **1935.** 3 figs., 14 eqs., 3 refs. **DWB**—An investigation of the elation between the temporary wind stress and the corresponding change of water level in an nclosed sea containing part of the numerical results obtained in a study of the high water level in saka Bay associated with the Muroto typhoon, Sept. 21, 1934. (For his analytical solution of the me problem with the result given by the integral equation of Volterra type, see *Ibid.*, 7:233–244, 933). (*Same item as* 6C-26, March 1955, *MAB.*) *Subject Headings:* **1. Hurricane tides 2. Muroto yphoon (1934) 3. Osaka Bay, Japan.**—*M. P. Kramer.*

1936

**7J-29** 551.515.2:551.461.2

Arakawa, Hidetoshi and Yoshitake, Motozi, **On the elevation of the surface of the sea under ne influence of a travelling low pressure.** *Physico-Mathematical Society of Japan, Tokyo, Proceed-ngs,* Ser. 3, 18(2):51–59, Feb. **1936.** 2 figs., table, eqs. **DLC**—Assuming an infinite and uniform

sea of constant depth and a low pressure area which exerts only normal pressure on the surface a in which there is uniform rectilinear motion, and providing that the low pressure area moves v slowly, the equations of motion are solved and the symmetry of the systems shown mathematica The following results were obtained: a) the elevation of the sea surface increases as the velocity c low approaches that of long waves; b) the lowering of the sea occurs in front and rear of the sto the elevation of the sea to the right and left (shown graphically). Application is made to Os Bay (27 m deep) and comparison with the Muroto Typhoon Sept. 21, 1934. *Subject Headin* **1. Hurricane tides 2. Muroto Typhoon (1934) 3. Osaka Bay, Japan.**—*M.R.*

**7J–30** 551.515.2:551.553.8(759,

De Monts, —, **Puissance destructive comparée des cyclones en Amérique et dans l'Océ Indien.** [Comparative destructive forces of cyclones in America and in the Indian Ocean.] *nales de Physique du Globe de la France d'Outre-Mer*, 3(17):157–159, Oct. **1936. DWB**—Wind for tidal level and rainfall in the Florida hurricane of Sept. 1935 and in the strongest typhoons of Réuni Island are compared. Maximum wind speeds of 360 km/hr were observed in the Florida hurrica producing a load of 1225 kg/m² on buildings. In the Indian Ocean the maximum wind speed m be assumed to be 224 km/hr (estimated from pressure data) which corresponds to a load of 600 much more than the 280 kg (175 km/hr) design load prescribed in the colonial building regulatio Tidal waves connected with hurricanes are found to be less powerful than those of seismic orig Rainfall in the Florida hurricane did not exceed 450 mm during the month as opposed to 2400 mm Réunion Island. *Subject Headings:* **1. Hurricane winds 2. Hurricane tides 3. Hurricane rainf 4. Hurricane, Florida (1935) 5. Florida 6. Réunion Island.**—*G.T.*

**7J–31** 551.515.2(52):551.461

Hirono, T., **The tsunamis caused by typhoons in Tokyo Bay.** *Meteorological Society of Japa Journal*, 2nd Ser., 14(7):348–369, July **1936.** In Japanese; English summary p. (62). **DWB**— Author found that tidal waves do not occur until high tides caused by astronomical tide, accumulati of sea water caused by air pressure, waves caused by winds, and the "dynamic suctional" moveme of sea water caused by low atmospheric pressure all act simultaneously. Contends that the tsunam are lateral oscillations of Tokyo Bay. (*Same item as* 6C–28, March 1955, *MAB.*) *Subject Heading* **1. Hurricane tides 2. Tsunamis 3. Tokyo Bay, Japan** —*Burns, Bertholf and Bates.*

**7J–32** 551.515.2:551.461

Tannehill, Ivan Ray, **Sea swells in relation to movement and intensity of tropical storm** *Monthly Weather Review*, 64(7):231–238, July **1936.** 9 figs., 3 tables, 8 refs. **DLC**—From variou observations of wave activity in the open sea and at the coast the general mechanism of hurrican swell is derived. It is shown how directional changes in wave activity and the period of the wav may be used as indications of the location, direction of movement, and force of a hurricane. Th effect of the shore line upon direction of the swell is considered. *Subject Headings:* **1. Hurricam swell 2. Hurricane movement.**—*G.T.*

**7J–33** 551.515.2:342.

U. S. Congress. House. Committee on World War Veterans' Legislation, **Florida hurrican disaster.** Hearings before the Committee on World War Veterans' Legislation House of Repre sentatives Seventy-Fourth Congress, Second Session on H.R. 9486. U. S. Government Printin Office, Wash., D. C., **1936.** 592 p. figs., tables. **DLC**—Testimony of over 20 witnesses befor the 20-member Committee is given in full, including documented material presented for the record The extensive hearings were held between March 26 and May 9, 1936 in connection with "A bil for the relief of widows, children and dependent parents of world war veterans who died as the result of the Florida hurricane at Windley Island and Matecumbe Keys, September 2, 1935." The purpos of the hearings was to fix the responsibility for the loss of life in the veterans' camps affected by the storm and to provide relief for eligible survivors. The witnesses were all officials having variou responsibilities in the disaster area. Their prepared statements and answers under cross examinatio reveal to the utmost detail the manner in which the disaster occurred and the measures taken t prevent it. The statement of IVAN R. TANNEHILL (p. 182–220) who was assistant chief of the U. S. Weather Bureau Forecasting Division at the time of the storm, contains a comprehensive description of the U. S. Weather Bureau hurricane warning service, the full text of all warnings an advisories issued by the U. S. Weather Bureau in connection with the storm, information on data on which such warnings were based, and detailed explanations in answer to questions by Committee members, covering all aspects of the Weather Bureau's actions. W. R. GREGG, chief of the U. S Weather Bureau, in his testimony (p. 220–234) principally discussed the possible need for actio to improve the hurricane warning service. *Subject Headings:* **1. Hurricane, Florida (1935) 2. Con gressional hearings 3. U. S. W. B. hurricane warning service 4. Hurricane forecasting. I. Tanne hill, Ivan R. II. Gregg, W. R.**—*G.T.*

1937

**7J–34** 551.515.2(51):551.556.1

**The action of typhoons on structures.** *Engineer*, London, 164:497–498, **1937.** diagr. **DLC**—Descriptive accounts of general damages of several typhoons and particular damage to gasholders at Hong Kong (May 1934) are given and some details of construction of a new gasholder to withstand typhoons are discussed. Some notes are made on typhoon engineering problems, squalls and rain, etc. *Subject Headings:* **1. Hurricane damage 2. Hong Kong.**—*H. P. Kramer.*

**7J–35** 551.515.2:551.461.2(52)

Hirono, T. and Sakata, K., **On abnormally high water in the Oosaka Bay.** *Meteorological Society of Japan, Journal*, 15(9):347–353, Sept. **1937.** 2 figs., foot-refs., eqs. In Japanese; English summary p. (33)–(34). **DWB**—From data for several typhoons, values of water level in Osaka Bay are expressed as functions of pressure anomaly and wind vector in the direction of the main axis of the bay. *Subject Headings:* **1. Hurricane tides 2. Osaka Bay, Japan.**—*G.T.*

**7J–36** 551.515.2:532.594

Leypoldt, Harry, **California seiches and Philippine typhoons.** *U. S. Naval Institute, Proceedings*, 63(6):775–788, June **1937. DN-HO**—Correlations are shown between cyclonic disturbances of the western Pacific Ocean and periods of severe beach swells in southern California. Sources for typhoon data are SELGA's **Charts of remarkable typhoons in the Philippines, 1902–1934** (*see* 7I–47, Sept. 1956, *MAB*), and since then the **Monthly Weather Review.** *Subject Heading:* **1 Typhoon seiches.**—*H. P. Kramer.*

1938

**7J–37** 551.515.2(74)

Federal Writer's Project, **New England Hurricane.** Boston, Hale, Cushman and Flint, **1938.** 220 p. photos throughout. **DWB**—In this "Factual pictorial record" of the New England hurricane of Sept. 1938 (called "the worst disaster that has ever struck New England") effects of the storm and floods on buildings, railroads, ships, trees and various installations are shown in several hundred photographs (about two per page). A great deal of factual detail is included in the legends. *Subject Headings:* **1. Hurricane damage 2. Hurricane, New England (1938) 3. New England.**—*G.T.*

**7J–38** 551.515.2(52):551.461.2

Kinka, T., **On the abnormally high water caused by the typhoon of Sept. 11, 1937 at the coast of Oosaka.** *Meteorological Society of Japan, Journal*, 2nd Ser., 16(2):80–85, Feb. **1938.** 2 figs., 2 tables, foot-refs., 16 eqs. Also his: **On the abnormal high water in the Oosaka Bay (Hukae) on Sept. 11, 1937.** *Ibid.*, 16(7):267–269, July **1938.** figs., foot-refs., 7 eqs. Both in Japanese; English summaries p. (7)–(8) and (23). **DWB**—Equations are given showing relations between height of sea level and meteorological elements during this typhoon. *Subject Headings:* **1. Hurricane tides 2. Typhoon, Osaka Bay (1937) 3. Osaka Bay, Japan.**—*H. P. Kramer.*

1939

**7J–39** 551.515.2:551.579.4(74)

American National Red Cross, **New York–New England hurricane and floods . . . 1938: official report of relief operations.** Wash., D. C., Oct. **1939.** 106 p. numerous figs., photos and tables; refs. **DWB**—Description (with illustrations) of damage caused by hurricane floods in New England on Sept. 21, 1938. The extensive Red Cross relief work is reported in detail with extensive case statistics. *Subject Headings:* **1. Hurricane flood damage 2. Hurricane, New England (1938) 3. New England.**—*G.T.*

**7J–40** 551.515.2(74):631.4

Bennet, Hugh Hammond, **A permanent loss to New England: soil erosion resulting from the hurricane.** *Geographical Review*, N. Y., 29(2):196–204, April **1939.** 14 figs. **DLC**—Soil erosion by wind-driven rain in the New England hurricane of Sept. 21, 1938 is described in terms of type of erosion, acreage and dollar value. The important part of strong wind in enhancing the eroding effect of rainfall is brought to attention. Photographs show erosion in a dozen different locations. *Subject Headings:* **1. Hurricane damage to soil 2. Hurricane, New England (1938) 3. New England.**—*G.T.*

**7J–41** 551.515.2:551.579.4(746)

†Bigwood, Burke L., **The hurricane floods of September 1938 in Connecticut.** *Connecticut Society of Civil Engineers, Annual Report*, 55:137–167, **1939.** 16 figs., table. Discussions p. 233–253. figs., table. Also: Daly, Charles J., **Effects of the hurricane on the Connecticut telephone**

**plant.** *Ibid.*, p. 169–181. 11 figs. Discussion p. 254–257. Also: Brown, Cecil W., **Some aspects of hurricane damage to public utilities.** *Ibid.*, p. 182–190. figs. Discussions p. 258–260. Also: Harte, Charles Rufus, **A partial list of booklets and articles on the hurricane of September 21, 1938.** *Ibid.*, p. 191–196. 83 refs. **DWB**—Damage caused in Connecticut by the hurricane of Sept. 21, 1938 is described. The first paper contains extensive precipitation and river gage data; in the second and third damage to telephone installations and other utilities is described and illustrated. The list of publications refers to 83 items dealing with this hurricane in general and by states (New England). *Subject Headings:* **1. Hurricane floods 2. Hurricane damage 3. Hurricane, New England (1938) 4. Connecticut**—*G.T.*

**7J–42** 551.515.2:551.461

Ootani, Tohei and Takasina, Y., **Waves and swells in relation to winds of typhoons.** *Meteorological Society of Japan, Journal*, 2nd Ser., 17:1–6, Jan. **1939.** 5 figs., 5 tables. In Japanese; English summary p. (1). **DLC**—Using data from 7 typhoons, 73 synoptic charts and 1193 observations of ships, two types of swell accompanying typhoon are discerned: 1) those which progress according to winds (which occur in every typhoon); 2) those which propagate from the typhoon center in a radial direction (which existed in only one of the seven typhoons), caused by oscillation of atmospheric pressure within central part of typhoon. *Subject Heading:* **1. Hurricane swell.**—*H. P. Kramer.*

**7J–43** 551.515.2:551.515.4(52

Ōtubo, K., **Thunderstorm activity and typhoon in Western Japan.** *Meteorological Society of Japan, Journal*, 2nd Ser., 17(5):202–206, May **1939.** 3 figs., foot-refs. In Japanese; English summary p. (18)–(19). **DWB**—Eleven typhoons which occurred in or near Japan from 1935 to 1938 are analyzed as to thunderstorm activity connected with them. It is found that: 1) When a typhoon enters the Eastern China Sea, thunderstorm occurs in some part of Kyushu; 2) No thunderstorm occurs when a typhoon moves NE-ward in the sea east of the Ryukyu Islands; 3) When a typhoon moves through Kyushu thunderstorm occurs in front of the typhoon preceding it by a few days. Severe thunderstorm was experienced in the east quadrant of the typhoon of July 25, 1937. The thunderstorm, which is considered the warm-front type, advanced northward as the center of the typhoon moved to the north. *Subject Headings:* **1. Typhoon-thunderstorm relationship 2. Western Japan.**—*From author's abstract.*

**7J–44** 551.501.83:551.515.2

Sashoff, S. P. and Weil, J., **Static emanating from six tropical storms and its use in locating position of the disturbances.** *Institute of Radio Engineers, N. Y., Proceedings*, 27(11):696–700, Nov. **1939.** 11 figs., 4 refs. **DLC**—Reprinted as: *Florida. Univ. Engineering Experiment Station. Bulletin*, No. 6, Nov. **1939.** 16 p. Also: Sashoff, S. P. and Roberts, W. K., **Directional characteristics of tropical storm static.** *Ibid.*, 30(3):131–133, March **1942. DLC**—Equipment and methods used at the Universities of Florida and Puerto Rico in obtaining and analyzing static connected with tropical storms are described. The paths of six storms as obtained by triangulating synchronized records of sferics are plotted on charts. It is suggested that discrepancies between these paths and those reported by the U. S. Weather Bureau may be due to the fact—partly verified by Florida observers—that static emanates from the peripheries of a storm rather than its center. In the second report it is found, in connection with a tropical storm which crossed Florida in Aug. **1939,** that a) apparently no static emanates from the eye of a storm and b) the relative position of static-producing areas remains fixed with respect to the storm center. (*Same items as* 4K–160 and 4K–172, Nov. 1953, *MAB.*) *Subject Headings:* **1. Sferics from hurricanes 2. Hurricane tracking.**—*G.T.*

**7J–45** 551.515.2:551.46

Terada, Kazuhiko, **On "tunami" or destructive sea waves excited by a travelling typhoon.** *Kobe, Japan. Marine Observatory, Memoirs*, 7(2):209–230, July **1939.** 8 figs., tables, refs., 17 eqs. **DWB**—The theory of seiches in a bay or lake excited by a traveling agency (e.g., typhoon) is treated mathematically and applied to Osaka Bay where tsunami excited by the Muroto Typhoon caused severe damage in 1934. The paper has also been published in Japanese in the *Central Meteorological Observatory, Memoirs*, Japan. V. 1, 1935 (*see* 7I–46, Sept. 1956, *MAB*) and in Japanese with English summaries in the *Met. Soc. of Japan, Journal*, 13:62–66 and 408–413, 1935, (English translation of Pt. 2 is available in "Selected translations from the Journal of the Met. Soc. of Japan," published by the U. S. Air Weather Service, Weather Central Div., Aug. 1945). *Subject Headings:* **1. Tsunamis 2. Storm surge calculations 3. Muroto Typhoon (1934) 4. Osaka Bay, Japan.**—*M. P. Kramer.*

1941

**7J–46** 551.515.2:355

Nelson, Frederick J., **Hurricanes and our new bases.** *U. S. Naval Institute, Proceedings,* 67(463):1273–1278, Sept. **1941. DLC**—Mechanisms through which hurricanes cause damage (high winds, storm tides, rainfall), the geographical distribution of hurricanes (and the consequent degree of menace to various naval bases) and measures to be taken at naval installations in the event of the approach of a hurricane, are described in broad lines. *Subject Headings:* **1. Hurricane damage 2. Military installations.**—*G.T.*

1944

**7J–47** 551.515.2(74):551.556.1

**The hurricane that side-stepped.** *Factory Mutual Record,* Boston, 21(11):3–5, Nov. **1944.** illus. **DWB**—The Sept. 14, 1944 hurricane which crossed New England, though as intense, did much less damage to factories than a similar one in 1938. Reasons given are: 1) the storm moved off to the NE instead of straight North, leaving the main part of the country in the quadrants of weaker winds, instead of the stronger winds as in 1938, 2) the tide was low at the time so less damage was caused by storm tides and flooding of coastal sections, 3) ample warning was received so everything was tied down that could be; only a few unanchored roofs were lifted. In this case 344 plants estimated damage at $880,000. In 1939, 900 plants were paid $6 million. *Subject Headings:* **1. Hurricane wind damage 2. Hurricane, New England (1944) 3. Hurricane tide damage 4. New England.**—*M.R.*

**7J–48** 551.515.2(74):551.556.1

Standard-Times, New Bedford Mass., **September 14, 1944 hurricane, southeastern Massachusetts.** unpaged. All photographs. Price: 50¢. **DWB**—In Sept. 1944 the second devastating hurricane hit New England only 6 yrs after the great 1938 hurricane. Adequate warnings and other factors (low tide) enabled loss of life to be kept to a minimum (31 compared with 588 in 1938). A collection of about 100 photographs and a map of storm damage area illustrates the variety and extent of damage done to Rhode Island and Eastern Massachusetts homes, churches, stores, boats, trees, factories, power lines, radio towers, etc. Winds were at least 105 mph. A note on the 1938 hurricane gives total property loss at $400,000,000 and maximum wind 100 mph. In this storm the greatest damage was due to the storm tide which rose 11.5 feet above normal high tide. In the 1944 storm the greatest damage was caused by the thousands of huge trees that fell against buildings or power lines. *Subject Headings:* **1. Hurricane wind damage 2. Hurricane, New England (1944) 3. Hurricane tide damage 4. New England.**

1945

**7J–49** 551.515.2(74)

Brooks, Charles F. and Chapman, Conrad, **The New England hurricane of Sept. 1944.** *Geographical Review,* N. Y., 35(1):132–136, Jan. **1945.** figs., refs. **DLC**—The progress of a hurricane over New England in Sept. 1944 is described; problems connected with forecasting its path, and the force and effects of the storm are discussed. Overall figures of damage are quoted. Tribute is paid to the hurricane warning service set up in the North Atlantic states and improved by rawin observation, expansion of the radiometeorograph network and installation of a special teletype system. *Subject Headings:* **1. Hurricane, New England (1944) 2. Hurricane warning services 3. New England.**—*G.T.*

**7J–50** 551.515.2(744)

Conrad, V., **Some remarks upon the destructive effects of the hurricane, September 14–15, 1944, observed at Hyannis, Cape Cod, Massachusetts.** *American Geophysical Union, Transactions,* 26(2):217–219, Oct. **1945. DLC**—As a witness of a hurricane that passed over Hyannis, Mass., the author reports his observations concerning effects of the hurricane winds on buildings and trees, and of surge effects on the coastline structures. *Subject Headings:* **1. Hurricane damage 2. Hyannis, Mass.**—*G.T.*

**7J–51** 551.515.2(914):551.507.352

§Humphrey, P. A. and Fite, R. C. (*U. S. Office of Naval Operations*), **Typhoon reconnaissance June through September 1945.** *U. S. Office of Naval Operations, NAVAER,* 50-1R-190, **1945.** 167 p. Also: U. S. Office of Naval Operations, **Typhoon reconnaissance: Meteorological Squadron One, May through November 1946.** *Ibid.,* 50-1RI206, **1947.** 241 p. plates, numerous charts. Also idem, **Typhoon reconnaissance: Meteorological Squadron One, May through November 1947.** *Ibid.,* 50-1R-206A, **1948.** 254 p. numerous charts, graphs, photos. **DWB**—The first report is a summary of experience gained in typhoon reconnaissance by search aircraft under the command of Commander aircraft, Philippine Sea frontier. The second report is a direct reprint, with only

minor changes, of original reports of pilots and crew of Meteorological Squadron One. It consists of detailed description of 13 typhoons, insofar as their history is revealed by the reconnaissance flights of the Meteorological Squadron. Notes on synoptic conditions and features of each typhoon as well as synoptic charts, vertical and horizontal cross sections, tracks, etc. are included. The third report contains original photographs from Meteorological Squadron One. Lacks several of the typhoons included above, but contains typhoon of Aug. 10–13, which is omitted from that. (*Same item as* 7I–73, Sept. 1956, *MAB.*) *Subject Headings:* **1. Typhoon reconnaissance 2. Aircraft weather reconnaissance 3. Radar echoes from typhoons.**—*H. P. Kramer, W.N.*

**7J–52** 551.515.23(265):656.6

Myers, Arthur John (*U. S. W. B.*), **Wind in a hurry!** [n.d.] 9 p. Typescript. **DWB**—The fatal disaster of the U. S. destroyer "Hull" is chosen to illustrate the force of a typhoon. The destroyer was caught in a typhoon off the Philippine Islands on Dec. 4, 1944, together with two other destroyers. Comments of the vessel's skipper and two crewmen, who were among the few survivors, are quoted. The formation and development of a typhoon and a few of its properties are described in popular terms. 10,000 feet is recommended for airplanes as a flight level through typhoons because "the turbulence tends to smooth out after 5000 ft altitude is reached." *Subject Headings:* **1. Typhoon formation 2. Typhoon damage to ships 3. Marine disasters 4. Pacific Ocean.**—*G.T.*

**7J–53** 551.515.2:551.461.

U. S. Office of Naval Operations, **Waves and swell from a tropical storm.** Its *NAVAER* 50-1T-30, Jan. **1945.** 24 p. 7 figs., 8 tables, 22 refs. **DWB**—The theory of the generation of wind waves, developed at the Scripps Institution of Oceanography, is applied to the case of swell from stationary or moving tropical storms. Diagrams showing values of wind velocity, effective fetch, waves, decay of swell, etc., in relation to direction and distance from storm center are presented. There is not enough reliable observational data available to test the accuracy of theoretical findings. *Subject Heading:* **1. Hurricane swell.**—*G.T.*

## 1946

**7J–54** 551.515.2(759):551.556.1

Carberry, D. E., **Timber hangar's collapse in Florida hurricane investigated.** *Civil Engineering*, New York, 16(9):388–390, Sept. **1946.** fig., photos. **DLC**—Engineering details of the failure of three Navy blimp hangars at Richmond, Fla., as revealed during the Court of Inquiry investigation, are discussed. The structures were designed for resistance to 110 mph winds as a "calculated risk" taken for wartime economies. In the hurricane on Sept. 16, 1945, gust velocities over 160 mph occurred at Richmond. *Subject Headings:* **1. Hurricane damage to hangars 2. Hurricane wind damage 3. Hurricane, Richmond, Fla. (1945) 4. Richmond, Fla.**—*G.T.*

**7J–55** 551.515.2(265):551.507.352

Chavasse, N. H., **AAF hurricane reconnaissance, Western Pacific, 1945.** *American Meteorological Society, Bulletin,* 27(9):510–518, Nov. **1946.** 5 figs., 4 plates. **DLC, DWB**—Aims and operations of the 55th Reconnaissance Squadron, Long Range, Weather, based on Guam, Iwo Jima and Okinawa during the last year of the war, are outlined and one of the missions flown by the Squadron (Reconnaissance Mission No. 733, Typhoon "Jean," Sept. 28, 1945) is described. Each phase of the flight through the typhoon is discussed. The superiority of contact flight to flight around the typhoon is stressed. A weather distribution chart, a route cross section and a radar weather distribution chart of the flight and cloud photographs are presented. *Subject Headings:* **1. Typhoon reconnaissance 2. Aircraft weather reconnaissance 3. Typhoon "Jean" (1945) 4. Western Pacific.**—*G.T.*

**7J–56** 551.509:550.342:551.515.2

Gilmore, Marion H., **Microseisms and ocean storms.** *Seismological Society of America, Bulletin,* 36(2):89–119, April **1946.** 15 figs. Also his: **Tracking ocean storms with the seismograph.** *American Meteorological Society, Bulletin,* 28(2):73–86, Feb. **1947.** 11 figs., table. **DLC**—The Microseismic Research Project described in these papers was started by the U. S. Navy in 1943 in an effort to find a better and cheaper method of locating and tracking severe tropical disturbances when several hundred miles from land. The microseismic data prove that a storm causes the ocean bottom over which it passes to vibrate and these more or less regular oscillations are called microseisms. They travel outward from the storm center in concentric circles and can be recorded on a microseismic seismograph. The amplitude of the microseisms recorded for a particular storm appears to depend principally on the storm's intensity and distance from a recording seismograph and to a less degree on the depth of the water over which it passes and on the position of certain

eep discontinuities of the earth's crust. The maximum effective distance a storm can be detected the Caribbean is about 600 mi while in the Pacific it is at least 1000 mi. (For other abstracts, e 5A–143 and 5A–147, Jan. 1954, *MAB.*) *Subject Headings:* **1. Microseismic storm trackng Hurricane tracking.**—*Author's abstract.*

**7J–57** 551.515:550.342

Gilmore, Marion H., **Microseisms classified according to type of storms.** *American Geophysical Union, Transactions*, 27(4):466–473, Aug. **1946.** 12 figs., table. **DWB**—The purpose of his paper is to present certain technical details involved in a proper interpretation of dominant icroseisms recorded in the Caribbean. Twelve figures are given that show microseisms produced y hurricanes, cold fronts, thunderstorms, fair weather, and artificial vibrations. These are classified nd listed in a table according to type, period, amplitude, form and duration. *Subject Heading:* **. Microseism classification.**—*Author's abstract.*

**7J–58** 551.515.2(729.2)

Jamaica. Meteorological Office, **A report on the hurricane of Northern Jamaica, August 20th, 944.** Kingston, **1946.** 4 p. 2 charts. **DWB**—Report includes the course of the hurricane over amaica, its pressure and wind characteristics, accompanying weather and damage. Pressure ecordings from Palisadoes Airport and Vernam Field (U.S.A.F.) and record from 2 upper air ascents ith wind finding balloons at Palisadoes during the hours preceding the storm are included. Over 0 people were killed and property was damaged to the amount of £3,000,000. Charts show hurriane track and rainfall for 24-hr period beginning at 7 a.m. on Aug. 20. *Subject Headings:* **1. Hurriane case histories 2. Hurricane, Jamaica (1944) 3. Jamaica, B.W.I. I. Gilbert, J. T.**—*M.L.R.*

## 1947

**7J–59** 551.515.2:550.342:551.509

Gutenberg, B., **Microseisms and weather forecasting.** *Journal of Meteorology*, 4(1):21–28, **947.** 6 figs., refs., 5 eqs. **DWB**—Certain types of microseisms are correlated with atmospheric isturbances and can be used in weather forecasting, especially in locating tropical disturbances. ublications referring to this method are mentioned. The method's routine application by the J. S. Navy Department in locating hurricanes in the Caribbean area is discussed, as well as the recautions which must be taken in drawing conclusions from the amplitudes of microseisms. (*Same tem as* 5A–148, Jan. 1954, *MAB.*) *Subject Headings:* **1. Microseismic storm tracking 2. Hurricane racking 3. Caribbean Region.**—*Author's abstract.*

## 1948

**7J–60** 551.515.2:551.579.4(52)

Japan. Central Meteorological Observatory, Tokyo, **Taihu to suigai.** [Typhoon and flood amage.] Tokyo, Chijin Book Co., Ltd., **1948.** 150 p. numerous figs. and tables, 4 plates. **DLC**—This is a synoptic and climatological case study of Typhoon "Kathleen," 1947, which caused evere damage on the mainland of Japan. Contents include: Ch. 1. Life history of the typhoon, Ch. 2. Mechanism of heavy rainfall, Ch. 3. Distribution of rainfall (total daily amount of rainfall t the Chichibu Weather Station on Sept. 15, 1947 reached 520 mm), Ch. 4. Floods, Ch. 5. Damage, Ch. 6. Historical floods in Kwanto District during past years, Ch. 7. Chronological list of heavy ainfall and floods and Ch. 8. Heavy rainfall in Tohoku District. (*Same item as* 7I–82, Sept. 1956, *MAB.*) *Subject Headings:* **1. Typhoon "Kathleen" (1947) 2. Synoptic studies 3. Typhoon amage 4. Flood damage 5. Japan.**—*H. Arakawa.*

**7J–61** 551.515.2:551.509.52:550.342

Leet, Lewis Don, **Causes of catastrophe; earthquakes, volcanoes, tidal waves, and hurricane.** New York, Whittlesey House, McGraw-Hill, **1948.** 232 p. numerous figs., charts, photos, tables. Also his: **Earth waves.** Cambridge, Mass., Harvard University Press, **1950.** 122 p. 58 figs., 0 tables, refs., 43 eqs. **DLC**—In the first of these two popular books Ch. 7, **Hurricanes and Typhoons** (p. 188–214) contains a discussion of many aspects of hurricane formation, movement, tructure, wind speeds, tides and a detailed account of the New England hurricane of 1938, with ix figures illustrating various features of the above. In the second book Ch. 4 (p. 110–120) clearly ums up current knowledge on microseisms and microseismic tracking of hurricanes, including iscussion of sources of error in tripartite measurements. (*Same item as* 7I–83 and 2.10–200, Sept. 956 and Oct. 1951, *MAB.*) *Subject Headings:* **1. Hurricanes 2. Microseismic storm tracking 3. Hurricane, New England, (1938).**—*M.R., G.T*

## 1949

7J–62 551.509.52:551.5

Owens, Clarence. **Giant of the West Indies.** *Air Force*, Dayton, Ohio, 32(1):29–32, 42, 1949. illus. DWB—Readable account of activities of Air Force in hurricane reconnaissance. ment on made of joint Air Force-Navy-Weather Bureau Hurricane Warning Center at M Fla. *Same item as* 1 42, Jan. 1950. *MAB.*) *Subject Headings:* 1. Hurricane forecasting 2. craft weather reconnaissance 3. West Indies.

7J–63 551.515.2 (914):551.5

Philippines. Weather Bureau. **Storm warning procedures.** Its *PWB Circular*, No. 15, S 1. 1949. plates, form. 2 refs. Mimeo. DWB—A review of general knowledge about typhoons the Far East, with enough technical information to permit the observer or receiver of the forec to understand how to report the implications of an approaching storm or to make proper use of warnings. The contents of the warnings, the distribution, places where visual warnings are plotted, and other information is included in this manual. *Same item as* 7.4–152, April 1 *MAB. Subject Headings:* 1. Typhoon warning services 2. Observers manuals 3. Philip Islands.—*M.R.*

## 1950

7J–64 551.515.2 (759):551.55

Anderson, E. A., and Suffir, Herbert S., **Miami suffers slight structure damage in severe hur cane.** *Civil Engineering*, N. Y., 20(12):36–38, Dec. 1950. fig., 6 photos. DLC—Pictures sh damage to radio towers and other structures during hurricane of Oct. 17, 1950. Anemogr record from roof of Ingraham Bldg. in Miami shows peak gusts above 150 mph for over 15 just before optimum wind shift. After shift peak gusts average 120 mph. [Statement of a sustai velocity of 150 mph for over 15 min is erroneous, as it is made by someone unfamiliar with evaluat anemograph traces, ed.] Maximum gust speed of 165 mph probable. Wind pressures on structu are calculated. It is estimated that 150 mph would indicate pressure of 74 pounds per sq ft a 165 mph would exert pressure of 90 pounds per sq ft. Overturned freight cars indicated 52 p more. (*Same item as* 2.5–77, May 1951, *MAB.*) *Subject Headings:* 1. Hurricane damage 2. Mia Fla.—*M.R.*

7J–65 551.515:551.556:551.4

Arthur, Robert S. **Wave and weather correlation at Apra Harbor, Guam, M.I. from 1 June 30 November, 1949.** California, Univ., Scripps Institution of Oceanography, Contract Nav 111, Task 6, Wave Report, No. 96, 1950. 6 leaves, 3 figs., 3 refs. DPL—Five situations w studied, three of which involved wind waves or swell from typhoons, and two involved cycl more than 1000 mi from Guam. The computed build up and decrease in wave heights agree w observations. More wind data are needed from typhoon areas, however, if height of damag waves are to be forecast accurately. When waves reach Guam with little or no decay from typh areas, the periods are much longer than forecast. Also: Miller, Robert L., **Wave and weath correlation at Apra Harbor, Guam, M.I., from March 18 to May 31, 1949.** Ibid., Wave Rep No. 90, Dec. 1949. (*Same item as* 5K–88, Nov. 1954, *MAB.*) *Subject Headings:* 1. Ocean swe forecasting 2. Typhoon swell 3. Guam 4. Pacific Ocean.—*M.R.*

7J–66 551.501.8:551.515

Fenton, Andrew H., **Men against hurricane.** *National Geographic Magazine*, 98(4):537–5 Oct. 1950. 21 photos. DLC—Describes detection and warning of hurricanes by means of home and ground radar in the east of Florida. Excellent photographs, of which one (color photograph taken at the Fleming Field Naval Air Station near Key West, Fla.) shows the spiral structu of an approaching hurricane about 30 mi away. (*Same item as* 2H–168, Aug. 1951, *MAB. Subject Headings:* 1. Radar observation of hurricanes 2. Florida.—*W.N.*

7J–67 551.515.2 (75

§Florida hurricane of October 17–18, 1950. *Weatherwise*, 3(5):136–137, Dec. 1950. 2 fig photo. DLC—The most violent hurricane to hit Miami since 1926 is described and copies of weath charts and barograph trace (lowest pressure 28.25 in.–956.7 mb) are reproduced. Heavy dama was confined to a small area. Jacksonville reported 27.78 in. of rain. Gusts 150 mph were repor 122 mph for 2 min and 97 for 5 min). (*Same item as* 2.4–80, April 1951, *MAB.*) *Subject Heading* 1. Hurricane, Miami (1950) 2. Miami, Fla.—*M.R.*

7J–68 551.515.23 (52):551.577.

Fukuda, K., On the relation between the path of typhoon and the heavy rainfall in Tōhō district. *Journal of Meteorological Research*, Tokyo, Vol. 2, Suppl. No. 10–20, Aug. 1950. figs

bles. In Japanese, English summary p. 108. **DWB**—Typhoons are classified according to their acks (12 types) and the origin and distribution of heavy rains in the Tôhoku district tabulated r each. Two types of track are found, one crossing Tôhoku and the other proceeding north off nriku. Most of the paper consists of a list of typhoons giving rains exceeding 50 and 100 mm. (*Same item as* 2.4–81, April 1951, *MAB.*) *Subject Headings:* **1. Typhoon tracks 2. Typhoon rainfall Tôhoku District, Japan.**—*C.E.P.B.*

**7J–69** 551.509.5:551.515.2

Gentry, R. C.; Moore, P. L. and Marshall, A. M., **Hoist hurricane warnings.** Miami Springs, la., Weather Vane Publications, **1950.** 50 p. 8 figs., 3 tables, photos, charts. **DWB**—In this digest of tropical storm information" prepared for the general public, the nature and characteristics of hurricanes and the practical aspects of hurricane warning and protection are discussed. The topics covered include the gathering of information in various stages of hurricane development, the functioning of warning services, the distribution of wind speed and destructive force within a hurricane, rains, tides, description of destructive storms of the past, etc. The numerous photographs show hurricane damage to a variety of objects. *Subject Headings:* **1. Hurricane warnings 2. Hurricane damage.**—*G.T.*

**7J–70** 551.515.2:551.46(794)

*§Horrer, Paul L., **Southern Hemisphere swell and waves from a tropical storm at Long Beach, California.** *U. S. Beach Erosion Board, Bulletin*, 4–3):1–18, July **1950.** 9 figs., table, 5 refs. **DGS**—The meteorological conditions producing wave action which destroyed or damaged breakwaters in the Long Beach area in 1930 and 1939 are analyzed and presented. Wave heights of 15 and 18 ft were measured by U. S. Engineers and 32 to 39 ft by U. S. Navy Observers in the Aircraft Carrier Lexington during the Sept. 1939 storm. The conclusion is that such conditions occur so rarely that it would be cheaper to reconstruct breakwaters after destruction each time, than to build structures that would withstand the swells from tropical storms. (*Same item as* 2.7–83, July 1951, *MAB.*) *Subject Headings:* **1. Hurricane wave damage 2. Wave heights 3. Long Beach, Calif.**—*M.R.*

**7J–71** 551.577.37:551.515.23(52)

Kasamura, S., **A relation between the path of typhoon or line of discontinuity and the rainfall distribution in the basin of the river "Onga."** *Journal of Meteorological Research*, Tokyo, 2(10): 319–322, Nov. **1950.** 8 figs., table. In Japanese; English summary p. (9). **DWB**—Distributions of heavy rains are classified into 7 types according to track of associated typhoon or line of discontinuity. The results are useful for flood forecasting. (*Same item as* 2.9–138, Sept. 1951, *MAB.*) *Subject Headings:* **1. Typhoon tracks 2. Typhoon rainfall 3. Onga River Basin, Japan.**—*C.E.P.B.*

**7J–72** 551.577.37:551.515.2(52)

Kusano, K., **The flood damage in Tôhoku district 1st and 2nd reports.** *Journal of Meteorological Research*, Tokyo, Vol. 2, Suppl. No.:34–46, Aug. **1950.** 4 figs., 18 charts, 6 tables. In Japanese; English summary p. 108. **DWB**—The relation of the center of heavy rainfall in Tohoku district to track and position of a typhoon is investigated. Heavy rainfall is expressed as mean of 10 representative points and frequency investigated. Periodicities of 3, 9 and 29 yrs are found (1895–1948). (*Same item as* 2.4–143, April 1951, *MAB.*) *Subject Headings:* **1. Flood damage 2. Typhoon rainfall 3. Typhoon tracks 4. Tôhoku District, Japan.**—*C.E.P.B.*

**7J–73** 551.515.2:551.46

Masuzawa, J., **Some examples of typhoons as a motive of variations of oceanographic conditions. Japan.** *Central Meteorological Observatory, Oceanographic Report*, 1(3):118–123, Sept. **1950.** 6 figs., 3 refs., 3 eqs. In Japanese; English summary p. 123. **DWB**—Meteorological and oceanographical observations carried out daily by research ships during the summer of 1949 revealed that when typhoons passed through the neighboring region the oceanographic conditions changed discontinuously from the sea surface to a depth of 200 m. These changes were caused by the inflow of different masses of water as a result of variations in the current system accompanying the typhoon. (*Same item as* 3.5–158, May 1952, *MAB.* *Subject Headings:* **1. Typhoon influences 2. Oceanographic conditions.**—*I.L.D.*

**7J–74** 551.515.2(52):551.577.37

Noguchi, I., **On the heavy rain caused by typhoon in Tôhoku district.** *Journal of Meteorological Research*, Vol. 2, Suppl. No.:29–34, Aug. **1950.** 12 charts. In Japanese, English summary p. 108. **DWB**—Typhoons along the same track sometimes bring heavy rain to Tôhoku, sometimes not. The cause of this is investigated synoptically. Heavy rainfall depends on convergence of the warm air in front of the typhoon as well as convergence in its center, the development of the Sea of Okhotsk

and mid-latitude anticyclones are also important. (*Same item as* 2.4–82, April 1951, *MAB.*) *Subject Headings:* **1. Typhoon tracks 2. Typhoon rainfall 3. Tôhoku District, Japan.**—*C.E.P.B.*

**7J–75** 551.515.2:551.57

Parker, Garald G. and Stringfield, V. T., **Effects of earthquakes, trains, tides, winds, and atmospheric pressure changes on water in the geologic formations of southern Florida.** *Economic Geology*, 45(5):441–460, Aug. **1950.** 5 figs., table, 19 refs. **DLC**—Water level in wells varies with many factors other than water availability: pressure from tides, the atmosphere, wind, seismic waves, etc. produce changes which are different in artesian than in other wells. Study of relation between water level and these factors gives information about the structure of the earth around the well. Chart shows observations on rainfall, pressure and water level at Miami during one week in Oct. 1944 (hurricane). (*Same item as* 2.3–146, March 1951, *MAB.*) *Subject Headings:* **1. Hurricane effects on water level 2. Miami, Fla.**—*M.R.*

**7J–76** 551.577.37:551.5

Syono, Sigekata, **On the vortical rain.** *Tokyo. Univ. Geophysical Institute, Geophysical Notes*, 3(25), **1950.** 3 p. fig., table, 4 refs., 6 eqs. **DLC**—Also in *Collected Meteorological Papers*, Tokyo, 2(2), Dec. **1950. MH-BH**—Intensity of rain in air converging because of surface friction is proportional to vorticity of gradient wind (vortical rain). The equation expressing this includes a factor containing many unknown constants; this factor is determined empirically from intensity of rain 113 km from center of a typhoon. The expression then gives values agreeing with intensity 113–800 km from center; there is a discontinuity at about 700 km. (*Same item as* 2.10–146, Oct. 1951, *MAB.*) *Subject Headings:* **1. Rainfall structure 2. Typhoon rainfall.**—*C.E.P.B.*

**7J–77** 551.582(261:74):656.61 551.515.2(261:74):551.509.

U. S. Coast and Geodetic Survey, **United States coast pilot, Atlantic coast, Section B, Cape Cod to Sandy Hook.** 5th ed. Its *Serial* No. 736, April 1, **1950.** 503 p. charts, diagrs., tables. In pocket: **Supplement,** Jan. 1, 1951, *Serial* No. 736-1. Price: $1.50. **DWB**—Describes forecast and warning service of U. S. Weather Bureau, marine climatological service, information service for transoceanic air transport, storm signals, broadcasts by U. S. Coast Guard, reports from ships, publications, and work of many other bureaus affecting shipping. A section on **Weather and climate** (p. 44–66) contains several charts and tables showing pressure, air and water temperature for Jan., April, July and Oct. along the Atlantic coast and in the Gulf of Mexico and Caribbean, a list of hurricanes since 1900, and a great deal of information on winds, fog, thunderstorms, cloud and hurricanes. The last subject is treated in special detail. Complete meteorological tables are appended for 10 stations along the Atlantic coast. (*Same item as* 7I–102, Sept. 1956, *MAB.*) *Subject Headings:* **1. Sailing directions 2. Hurricane warning services 3. Marine forecasting 4. Atlantic Coast of United States.**—*M.R.*

## 1951

**7J–78** 551.515.23(265):656.60

Baldwin, Hanson W. (*Military Editor, N. Y. Times*), **When the Third Fleet met the Great Typhoon.** *New York Times Magazine*, p. 18–19, 48–52, Dec. 16, **1951.** illus. **DWB**—The disaster of the 3rd Fleet caused by a typhoon on Dec. 17 and 18, 1944 to the east of Luzon Island, is described in a popular manner. Details of the hardships and losses suffered by the fleet are given. A barometer reading of 27.30 in. and a wind velocity of 124 kn are claimed. Photographs of wrecked and other damaged ships and a radarscope photograph are presented. It is pointed out that "large errors" had been made in locating the storm. (*Same item as* 4.2–122, Feb. 1953, *MAB.*) *Subject Headings:* **1. Typhoon damage 2. Typhoon tracking 3. Marine disasters 4. Pacific Ocean.**—*G.T.*

**7J–79** 551.515.2:550.342:551.46

Donn, William L., **An investigation of swell and microseisms from the hurricane of August 13–16, 1946.** Columbia University. Lamont Geological Observatory, Contract AF 19(122)441 and Contract N6-onr-27133, Technical Report, No. 17, Oct. **1951.** 8 p. 3 graphs, 7 refs. **DWB**—The observed lack of relationship between the period of swell and microseisms associated with the same storm seems to indicate that the microseisms are not caused by the swell. It appears that the microseism origin may lie "in the area directly beneath the storm and result from some coupling mechanism at the water-air interface." (*Same item as* 4.1–103, Jan. 1953, *MAB.*) *Subject Headings:* **1. Hurricane microseisms 2. Hurricane swell 3. Ocean-atmosphere interaction.**—*M. P. Kramer.*

**7J–80** 551.515.2:551.556.1:551.577.61:368

Hart, M. C., **Tropical revolving storms and windstorm insurance.** *Chartered Insurance Institute, London, Journal*, 48:89–143, **1951.** 13 figs. **DWB**—After a popular account of causes, frequency and tracks of storms and wind force with references to insurance premiums, author takes

ip building construction to resist wind and assessment of wind damage risk to buildings. Other ections deal with damage to crops and trees, fire following storm, and damage by rain, floods and idal waves. Finally the practical aspects of insurance schemes are referred to. (*Same item as* 3.9–138, Sept. 1954, *MAB.*) *Subject Headings:* **1. Hurricane damage 2. Hurricane insurance.** —*C.E.P.B.*

**7J–81** 551.515.2:551.461.2

Ichye, Takashi (*Kobe Marine Obs.*), **On the abnormal high water caused by the typhoon "Jane."** *Japan. Central Meteorological Observatory, Tokyo Oceanographical Report,* 2(2):191–198, Dec. **1951.** 10 figs., 5 refs., eqs. In Japanese; English summary p. 198. **DWB**—The meteorological tides on the coast of Osaka Bay due to typhoon "Jane" are computed as a forced secondary oscillation of the bay water by the wind stress and pressure variation accompanying the typhoon. *See also:* Terada, T. and Yamaguti, S., **On the effect of cyclone upon sea level.** *Imperial Academy of Japan, Tokyo, Proceedings,* 4:478–480, **1928.** (*Same item as* 6C–51, March 1955, *MAB.*) *Subject Headings:* **1. Hurricane tides 2. Typhoon "Jane" (1950) 3. Osaka Bay, Japan.**—*From author's abstract.*

**7J–82** 551.501.81:551.515.2:06

Jorgensen, R. C. and Gerdes, W. F., **The Dow Chemical Company leads industry in using radar for hurricane detection.** *American Meteorological Society, Bulletin,* 32(6):221–224, June **1951.** 3 figs. Also: **Radar tracks hurricanes: results promise aid in system operation.** *Electrical World,* 133(17):91–93, April 24, **1950.** 5 photos. **DLC**—Radar has been used since June 1948 by the Dow Chemical Co. for detecting hurricanes approaching its Freeport, Texas, plant. This plant must start closing 12 hrs before the hurricane strikes, so it will be shut down during the storm. Advance and accurate warnings save "false alarm" shutdowns which are costly. Three radar stations operated by the U. S. Weather Bureau, three by industrial concerns and two by educational institutions are operating on the Gulf Coast to obtain more detailed, continuous information on hurricanes. (*Same items as* 9–18 and 2H–229, Sept. 1950 and Aug. 1951, *MAB.*) *Subject Headings:* **1. Radar storm detection 2. Hurricane warning services 3. Industrial meteorology 4. Texas.**—*M.R., W.N.*

**7J–83** 551.515.2:532.593:550.342

Kammer, E. W. and Dinger, J. E., **Hurricane swell as a generator of microseisms.** *Journal of Meteorology,* 8(5):347–353, Oct. **1951.** 12 figs., table, 11 refs. **MH-BH**—From records of seismographs on Bahamas and east coast of the United States, it is concluded that microseisms associated with hurricanes do not originate on ocean floor below center. Longer periods are associated with higher wind speeds and are half of swell period independent of water depth. Amplitude increases rapidly as storm approaches shore, but decreases much more slowly as it moves away. Dominant source of microseisms is standing waves on ocean bottom near shore. (*Same item as* 3.5–156, May 1952, *MAB.*) *Subject Headings:* **1. Hurricane microseisms 2. Microseism origin 3. Bahama Islands 4. Atlantic Coast of United States.**—*C.E.P.B.*

**7J–84** 551.515.21:551.461.2

Kawabata, Y. and Fujito, M., **Elevation of the sea surface caused by typhoons.** *Meteorological Society of Japan, Journal,* 2nd Ser., 29(2):37–44, Feb. **1951.** 5 figs., table. In English; Japanese summary p. 43. **MH-BH**—Rise of water level is made up of suction by low pressure, wind drift, etc. Times of highest water in relation to lowest pressure are examined for a number of typhoons and it is found that the maximum generally occurs when typhoon center is nearest. A prediction diagram is given for minimum height of high water level. (*Same item as* 3.4–134, April 1952, *MAB.*) *Subject Heading:* **1. Hurricane tides.**—*C.E.P.B.*

**7J–85** 551.515.2(265.4):551.461.2

Miyazaki, M. (*Kobe Marine Obs.*), **Destructive waves caused by heavy storms in Osaka Bay.** *Japan. Central Meteorological Observatory, Tokyo, Oceanographical Report,* 2(2):103–114, Dec. **1951.** 18 figs., 3 refs., 31 eqs. In Japanese; English summary p. 113 114. **DWB**—The typhoons "Muroto" and "Jane" brought about abnormally high water levels in Osaka Bay. At the innermost part of the bay the highest water levels were observed to occur tens of minutes after the arrival of their centers and at the mouth slightly after (Muroto) or before ("Jane") the arrival. The maximum height above normal water level ranged at the innermost parts 3 to 4 m for "Muroto" and 2 to 2.5 m for "Jane." At the mouth it was about half these values. Marked secondary vibrations were also recorded by tidal gages with predominant periods of 310 and 70 min. All these results are in good agreement with the author's theoretical calculations developed in this paper. *Subject Headings:* **1. Hurricane tide damage 2. Osaka Bay, Japan.**—*From author's abstract.*

**7J–86** 551.515.2:551.461

Miyazaki, M.; Yoshizawa, H. and Ushioda, T., **Meteorological tides caused by the typho- "Kezia" along Japanese coasts in the dangerous semicircle.** *Japan. Central Meteorologic Observatory, Tokyo, Oceanographical Report,* 2(1):75–86, May **1951.** 6 figs., 7 refs., 9 eqs. Japanese; English summary p. 86. **DWB**—High winds and low pressure of a typhoon plus t water transport associated with the northward translation of the storm system accounted for ris of sea level along Japanese coasts. A maximum rise of 125 cm was the result of enhancement of t typhoon effects by local conditions. (*Same item as* 6C–54, March 1955, *MAB.*) *Subject Heading* **1. Hurricane tides 2. Typhoon "Kezia" (1950) 3. Japan.**—*M. P. Kramer.*

**7J–87** 532.59:525.

Schönfeld, J. C., **Propagation of tides and similar waves.** 'S-Gravenhage, Staatsdrukkerij- Uitgeverijbedrijf, **1951.** 232 p. 118 figs., 11 tables, 12 graphs (fold.) in pocket, refs., eqs. Dutc and French summaries p. 222–227. **DWB**—Report comprises an essentially one dimension investigation of the propagation of tides in estuaries and, more generally, of all kinds of hydraul wave motions of the long wave type, including storm tides in canals and similar conduits. A introduction includes a short survey of the elementary theory and a derivation of the necessa differential equations. Pt. I describes and compares the "harmonic" and "characteristic" co ceptions of defining the behavior of long wave motions. In Pt. II the accuracy of methods of co puting particular wave motions is tested empirically by performing computations in connection wit a controlled laboratory experiment. Efficiency of various methods evaluated. (*Same item* 5.6–5, June 1954, *MAB.*) *Subject Headings:* **1. Tide propagation 2. Tidal waves 3. Storm tide** —*M. P. Kramer.*

**7J–88** 551.509.52:551.515.

§Shisler, Karl, **An initial solution to the hurricane problem of the offshore oil operator in th Gulf of Mexico.** *American Meteorological Society, Bulletin,* 32(3):79–88, March **1951.** 8 figs table, 5 refs. **DWB**—The necessity for adequate warning of the exact time and strength of hurrican onset to allow for shutting down offshore oil drilling in the Gulf of Mexico is propounded. A nove series of charts is presented for use in calculating average evacuation period for hurricanes originatin in the Atlantic, Caribbean or Gulf, respectively. Techniques followed during a typical storm ar outlined wherein knowledge of synoptic meteorology, climatology and oceanography are combine to give optimum advice. (*Same item as* 2.9–48, Sept. 1951, *MAB.*) *Subject Headings:* **1. Industria forecasting 2. Hurricane warnings 3. Gulf of Mexico.**—*M.R.*

**7J–89** 551.515.2(261,729):551.507.352

*U. S. Air Weather Service, **Hurricanes of 1950: narrative history of each storm and comments on hurricane reconnaissance.** *U. S. Air Weather Service, Technical Report,* No. 105-77, July **1951** 92 p. 13 tables. Photostat. **DWB**—Illustrated analysis of 13 tropical storms in the Caribbean and N. Atlantic from Aug. 7–Oct. 29, 1950, and thorough discussion (with data) of reconnaissance activities of the Air Force and Navy during that season. (*Same item as* 7I–115, Sept. 1956, *MAB.*) *Subject Headings:* **1. Hurricane reconnaissance 2. Hurricane data 3. Hurricane forecasting 4. Caribbean Sea.**—*M.R.*

**7J–90** 551.577.37:551.515.22(52)

Yoshino, I., **On the heavy rainfall in Shikoku District accompanying the tropical storm of Aug. 1948.** *Journal of Meteorological Research,* Tokyo, 3(5):157–165, March **1951.** 9 figs., table. In Japanese; English summary p. (12). **DWB**—The heavy rainfall resulted from the S–N disturbance of a W–E trough. The NP maritime air mass on the north side of the trough which seemed to come from the Arctic anticyclone stayed in the Sea of Okhotsk for a week and caused the heavy rainfall by damming up the equatorial maritime air accompanying the tropical storm. (*Same item as* 4.4–208, April 1953, *MAB.*) *Subject Headings:* **1. Excessive rainfall 2. Tropical cyclones 3. Shikoku District, Japan.**—*I.L.D.*

## 1952

**7J–91** 551.515.22:551.507.352

**Flying through a typhoon.** *Boeing Magazine,* Seattle, Wash., 22(11):12–13, Nov. **1952.** illus. **DWB**—Summaries of descriptive accounts by Capt. W. E. Beard and Maj. Chester Koniak (54th Strategic Reconnaissance Squadron, Guam) of their typhoon exploration flights in Sept. 1952. Cloud, draft and turbulence conditions encountered at various stages of the flights are reported. Photographs include a picture of cloud formation in the typhoon. The typhoon explored was "Olive" in the Wake Island region. (*Same item as* 4.10–128, Oct. 1953, *MAB.*) *Subject Heading:* **1. Typhoon reconnaissance 2. Typhoon Olive** (1952) **3. Wake Island.**—*G.T.*

**7J–92** 551.515.2(729.6):550.342

Kammer, Erwin W. and Dinger, J. E. (*both, U. S. Naval Research Lab.*), **Results of field experiments during 1951 on microseisms as related to storms at sea.** *U. S. Naval Research Laboratory, NRL Memorandum Report*, No. 3, April 18, **1952.** 10 p. 5 figs. Also: Kammer, E. W., **Directional properties of microseisms during hurricane "Easy" 1951.** *Journal of Meteorology*, 9(5):367–368, Oct. **1952.** 2 figs., ref. **DWB**—Data recorded during the 1951 hurricane season at a tripartite seismograph station on Grand Bahama, pressure type wave gages at Cocoa Beach, Fla., and a horizontal component seismograph at Orlando, Fla., seem to indicate that microseisms are generated by water waves over the continental shelf rather than in deep water areas under the storm itself. *Subject Headings:* **1. Microseisms 2. Hurricane tracking 3. Hurricane "Easy" (1951) 4. Bahama Islands.**

**7J–93** 551.515.23(914)

Manalo, Eugenio B. (*Meteorologist, Surigao, Philippines*), **Surigao's report on Typhoon Emma.** *Philippines. Weather Bureau, The Elements*, 3(8):5–6, Aug. **1952. DWB**—Instrumental and personal observations made at Surigao Weather Station in connection with the close passage of a typhoon on July 2, 1952 are reported. The considerable damage was caused by a tornado preceding the typhoon rather than by the typhoon itself. *Subject Headings:* **1. Typhoon "Emma" (1952) 2. Philippine Islands.**—*G.T.*

**7J–94** 551.553.8:551.556:699.83

**Man-made hurricane tests windows.** *Engineering News-Record*, p. 49–50, June **1952. DWB**—Tests of window resistance to hurricane and torrential rain, conducted by H. HORTON SHELDON, Univ. of Miami, are described. A blower producing air speeds up to 140 mph and propelling water at the rate of 20 gpm, operates at 20 ft from test windows. Air and water infiltration is measured behind the windows. A standard test lasts 12 min, 10 at slightly above 100 mph steady and 2 at 80–120 mph gusty air flow. Permissible infiltration is 75 cfm air and 0.20 gpm water. (*Same item as* 6.2–211, Feb. 1955, *MAB.*) *Subject Headings:* **1. Hurricane-force winds 2. Building resistance. I. Sheldon, H. Horton.**—*G.T.*

**7J–95** 550.342:551.515.2

Nagamune, T., **Microseisms caused by typhoon.** *Japan. Central Meteorological Observatory, Tokyo, Quarterly Journal of Seismology*, 16(2):51–56, June **1952.** 7 figs. In Japanese; English summary p. 56. **MH-BH**—Charts showing the paths of typhoons "Marge" and "Ruth" (Aug. and Oct. 1951) and data on frequency distribution of corresponding microseisms with different lengths of period are presented and discussed. A comparison is made between microseisms caused by typhoon "Marge" with those connected with typhoon "Ruth." Correlation between period and amplitude of the recorded microseisms is graphically represented. *Subject Headings:* **1. Typhoon microseisms 2. Typhoon "Marge" (1951) 3. Typhoon "Ruth" (1951).**—*G.T.*

**7J–96** 551.515.2:551.556.1/2

§Polovkas, Vincent G. and Thompson, Robert A. (*Florida Univ., Dept. Aeron. Engr.*), **A storm protection laboratory for testing building components and other materials under hurricane conditions.** *Florida. Univ. Engineering and Industrial Experiment Station, Engineering Progress*, 6(9), Sept. **1952;** *Bulletin* No. 56. 15 p. 10 figs., form, refs., bibliog. p. 15. **DWB**—The history of the studies of hurricane damage to structures, etc. in Florida in general and the Univ. of Florida Storm Protection Laboratory in particular, is reviewed. The laboratory and some of the operations in it are described and illustrated. Most of the tests are with respect to wind and rain stresses on buildings, doors, windows, shutters, electronic equipment and human beings. Sample test records, including complete meteorological data, are reproduced. (*Same item as* 5.9–141, Sept. 1954, *MAB.*) *Subject Headings:* **1. Hurricane damage laboratories 2. Wind load on structures 3. Hurricane damage 4. Florida. University. Storm Protection Laboratory.**—*M.R.*

**7J–97** 551.515.2(73/9):656.608

Snow, Edward Rowe, **Great gales and dire disasters.** New York, Dodd, Mead, **1952.** 263 p. plates. **DWB, DLC**—This series of narrative accounts of marine disasters on the eastern coasts of North America includes several descriptions of hurricanes, and the shipwrecks and other destruction caused by them. The Galveston hurricane of 1900 (p. 21–33) and the complete destruction on Ile Dernière off the southern coast of Louisiana in 1856 (p. 221–229) are those most fully described. Other accounts of hurricanes may be located through the index (under "Hurricanes," p. 257). (For fuller abstract, *see item* 4.11–119, Nov. 1953, *MAB.*) *Subject Headings:* **1. Marine disasters 2. Historic storms 3. Atlantic coast of United States.**—*G.T.*

**7J–98** 551.515.2(52):550.34

*Wadati, Kiyoo; Inouye, Win and Hirono, Takuzo, **On the relation between typhoon and microseisms.** *I.U.G.G. Association of Seismology, Publications du Bureau Central Seismologique International, Ser. A, Travaux Scientifiques*, No. 18:71–82, **1952.** 2 tables, figs., 7 refs. **DWB, DLC**—Microseismograms obtained at 14 seismological stations in Japan during the passage of 5 typhoons and a cyclone (1949–1951) are graphically analyzed in conjunction with the proximity of the storms and the roughness of the sea. Among several other conclusions it is thought that microseisms are generated by swell propagated to the coast, rather than by tremors originating at the sea bottom beneath the typhoon's center. *Subject Headings:* **1. Typhoon microseisms 2. Japan.**—*G.T.*

## 1953

**7J–99** 551.515.2(265.2):551.556:551.46

Arakawa, H. and Suda, K., **Analysis of winds, wind waves and swell over the sea to the east of Japan during the typhoon of Sept. 26, 1935.** *Monthly Weather Review*, 81(2):31–37, Feb. **1953.** 6 figs., 8 tables, 8 refs. **DWB**—An analysis of winds, wind waves and swell over the sea to the east of Japan during the historical typhoon of Sept. 26, 1935, is given. Occurrence of the storm and its movement across a main squadron of the Imperial Japanese Fleet which was then conducting grand maneuvers provided what may be the best coverage on record of surface winds, wind waves, and swell within 200 naut mi of a typhoon center in its mature stage, and furnished an unequaled set of data for studying the relation between the meteorological and oceanographical elements over the ocean during a period of hurricane winds. (*Same item as* 4.11–188, Nov. 1953, *MAB.*) *Subject Headings:* **1. Hurricane waves 2. Hurricane swell 3. Western Pacific.**—*Authors' abstract.*

**7J–100** 551.515.2(265)

Butler, Jack (*Standard Oil Co., Wake Island*), **Olive was no lady.** *Standard Oiler*, San Francisco, 15(5):12–15, May **1953.** illus. **DWB**—Popular description of a typhoon, which occurred on Wake Island in the Pacific and was successfully forecast by the local Weather Bureau. *Subject Headings:* **1. Typhoons 2. Typhoon "Olive" (1952) 3. Wake Island, North Pacific.**—*A.A.*

**7J–101** 551.524.36:551.515.2(759)

§Day, Richard Lovey (*Univ. of Florida*), **Weather extremes in Florida during 1950–1951.** *Florida Academy of Science, Quarterly Journal*, 16(2):102–109, June **1953.** 2 plates (fold.), 4 refs. Abstracted from reprint. **DWB**—Jan. 1950 was second warmest (+9°F) and driest (av. 0.39″) Jan. on record, June also had record heat and drought. Three fully developed hurricanes entered Florida in 1950. The Cedar Key storm of Sept. 5–6 brought one of the heaviest rains ever recorded in the U. S.; 24.50″ or more in a little over 24 hours. The Oct. 18 hurricane at Miami was accompanied by gusts of 150 mph and rainfall of 15″ (Titusville, Fla.). On Nov. 25–26, 1950 record low temperature for Nov. of 16°F occurred at Secotan at the time of the great snowstorm of New York City. Then on Feb. 3 and 4, 1951, another record cold wave brought 10°F to Crestview in NW Florida (the record was −7°F at Tallahassee in Feb. 1899). Two inches of snow fell at St. Augustine —heaviest in Florida since 1899. Charts show isobars and mean isotherms for above events. (*Same item as* 6.4–194, April 1955, *MAB.*) *Subject Headings:* **1. Cold waves 2. Hurricanes, Florida (1950) 3. Florida.**—*M.R.*

**7J–102** 551.515.2:551.577.37(524)

Fuchimoto, H., **On the heavy rainfall due to typhoon in Hokkaido.** *Journal of Meteorological Research*, Tokyo, 5(7):621–624, Aug. **1953.** 8 figs. In Japanese; English summary p. 621. **DWB**—The method of "percentage maps of rainfall" was applied to heavy rainfall due to typhoon in Hokkaido, showing the percentage distribution of every rainfall, the value of 100% corresponding to maximum precipitation amount. By using the method, the special features of heavy rainfall due to typhoon in Hokkaido may be described as follows: (1) When fronts are located near Hokkaido, heavy rainfall occurs frequently even if the typhoon is distant. (2) Rainfall amount is larger in the neighborhood of the path of typhoon than at a distance from it. (3) Heavy rainfall frequently occurs in a region of deltoid plains formed by two mountain ranges. *Subject Headings:* **1. Typhoon rainfall 2. Rainfall analysis 3. Hokkaido, Japan.**—*From author's abstract.*

**7J–103** 551.515.2:551.55:69

Gentry, Robert C., **Wind velocities during hurricanes.** *American Society of Civil Engineers, Proceedings*, v. 79, Separate No. 218, July 1953. 26 p. 15 refs., eqs. **DWB**—This paper aims to provide the designing engineer with information on the strength of winds and gusts in hurricanes. The discussion covers the following topics: structure of hurricanes, duration of winds within hurricanes, forces, distribution of wind velocity within hurricanes, examples of high wind velocities recorded during hurricanes, gust factor and gust ratio, variation of wind velocity with height above

round and the probability of occurrence of hurricane force winds. (*Same item as* 7I–130, Sept. 956, *MAB.*) *Subject Headings:* **1. Hurricane force winds 2. Gust loads 3. Applied meteorology 4. Building construction.**—*I.L.D.*

**7J–104** 551.515.2(729)

Grinsted, W. A., **Weather conditions in Trinidad and Barbados, 11 to 15 October 1952.** *Weather*, 8(8):253–254, Aug. **1953. DWB**—Weather associated with two tropical disturbances included thunderstorms, hail and a small tornado in Trinidad and barometer fluctuations of about 5 min period, with squalls, in Barbados. *Subject Heading:* **1. Hurricane weather 2. West Indies.**—*C.E.P.B.*

**7J–105** 551.515.2(529):551.46

Huckins, H. G. U., **Typhoon "Dinah."** *Weather*, 8(3):95, March **1953. DWB**—Account of "tidal wave" 100 ft high, in rear of typhoon north of Formosa, June 23, 1952. (*Same item as* 4.8–103, Aug. 1953, *MAB.*) *Subject Headings:* **1. Hurricane tides 2. Typhoon "Dinah" (1952) 3. Formosa.**—*C.E.P.B.*

**7J–106** 551.501.83:551.515.2(52)

Kimpara, Atsushi (*Nagoya Univ.*), **The typhoon Ruth and atmospherics.** *Journal of Geomagnetism and Geoelectricity*, Kyoto, 5(1/2):1–7, June **1953.** 7 figs., 4 refs. **DLC**—The author observed atmospherics concerning typhoon "Ruth" which attacked Japan in Oct. 1951. He found that origins of atmospherics are not only scattered over the convergence area of the typhoon as in the case of typhoon "Kezia" in Sept. 1950, but also they are distributed in the convergence area in front of the trough of westerly waves as well as easterly waves, both of which are very likely connected with the typhoon. In this case he employed fairly sensitive cathode ray direction finders, and he expects to be able to find more detailed characteristics of typhoon and other similar meteorological phenomena by using more sensitive apparatus and waveform measuring equipment. (*See also* 4K–264, Nov. 1953, *MAB.*) *Subject Headings:* **1. Sferics from typhoons 2. Typhoon "Kezia" (1950) 3. Typhoon "Ruth" (1951) 4. Western Pacific.**—*Author's abstract.*

**7J–107** 551.515.3:551.515.2(755)

Malkin, W. and Galway, J. G. (*U. S. W. B., Wash., D. C.*), **Tornadoes associated with hurricanes, as illustrated by Franconia, Va., tornado, Sept. 1, 1952.** *Monthly Weather Review*, 81(9):299–303, Sept. **1953.** 6 figs., tables, 17 refs. **DWB**—One of the tornadoes associated with hurricane "Able," 1952, occurred near Washington, D. C., and simultaneously with the upper air sounding made there. This led to a comparison between this particular tornado, along with others of similar environment, and conditions attributed to tornadoes in general. All such tornadoes associated with hurricanes have to date been observed only in the forward semicircle or along the advancing periphery of the tropical storm. The evidence is strong in favor of time of day having little relation to the occurrence of such tornadoes. A hypothesis is suggested wherein the weaker or nonexistent cyclonic horizontal wind shear of the environment may contribute to the lesser severity of these tornadoes. Unlike the typical tornado sounding, the limited evidence indicates the absence of (1) a low level temperature inversion, (2) sharp moisture stratification of dry air over moist air, (3) excessive instability. (*Same item as* 7I–135, Sept. 1956, *MAB.*) *Subject Headings:* **1. Tornadoes associated with hurricanes 2. Hurricane "Able" (1952) 3. Franconia, Va.**—*Authors' abstract.*

**7J–108** 551.515.2(04):551.509.5

[Merek, Ted], **Hurricane weather.** *Texas City Carbide News*, 4(8):13–15, 29–31, Aug. **1953.** fig., photos. **DWB**—Popular articles based on an interview with ERNEST CARSON, meteorologist in charge at the Weather Bureau Office, Galveston, Tex. Physical properties and characteristic features of hurricanes are described. The extensive Weather Bureau Hurricane Warning Service is discussed. *Subject Headings:* **1. Hurricanes 2. Hurricane warning services 3. Popular meteorology.**—*G.T.*

**7J–109** 551.515.2(729,75)

Norton, Grady, **Hurricanes of 1953.** *Monthly Weather Review*, 81(12):388–391, Dec. **1953.** fig., ref. **DWB**—Tracks of 8 hurricanes (6 of which reached full hurricane force) that occurred in the West Indies from May 25 to Oct. 10, 1953 are shown on chart. Two of these touched the east coast of the United States ("Barbara" passed over Hatteras and "Carol" struck the coast of Maine near Eastport), and two struck the Gulf coast at the Florida Panhandle ("Alice" and "Florence"). Individual storms are described, including damage resulting therefrom. *Subject Headings:* **1. Hurricanes, 1953 2. Hurricane tracks 3. West Indies 4. Eastern United States.**—*M.R.*

**7J–110** 551.509.5:551.515.2:[illegible]

Reese, Al and Spann, Robert E., **When the big winds blow (Pts. 1, 2).** *World Oil*, Houston, Texas, 136(7):48–52, June **1953**; 137(1):68–70, July **1953.** figs., tables, photos. **DLC**—"The tropical storm that puffs and bluffs around the Gulf" will often cause a loss of millions through unnecessary or premature shutdown of oil installations. This article deals with the U. S. Weather Bureau Hurricane Warning Service, describing its set-up, equipment and methods. The major part of the paper is devoted to storm detection by means of the extensive radar network maintained in the Gulf region by the U. S. Weather Bureau and several research or commercial organizations. Scientific and technical aspects of radar storm detection are discussed and illustrated. The operation of the radar storm warning service provided by A. H. Glenn & Assoc. of New Orleans (serving 1[illegible] operators) is described. (*Same item as* 6.1–94, Jan. 1955, *MAB.*) *Subject Headings:* **1. Hurricane warning services 2. Hurricane tracking 3. Gulf of Mexico.**—*G.T.*

**7J–111** 551.556:551.515.2:6[illegible]

Saffir, Herbert S. (*Asst. County Engr., Dade County, Miami, Fla.*), **The effects on structures of winds of hurricane force.** *American Society of Civil Engineers, New York, Proceedings*, Vol. 79, Separate No. 206, July **1953.** 19 p. 18 figs., 2 tables. **DLC**—The damage caused by the hurricanes that struck Florida in 1950, 1926, 1945, 1947 and 1948 are described in detail, the chronologies of hurricanes from 1926 to 1950 including their total number, number reaching the U. S. coast and the damage caused are listed, and the wind velocities during hurricanes are discussed. The various wind loading specifications in the Florida building codes are mentioned and methods for obtaining data for wind pressures on structures are cited. (*Same item as* 5.9–202, Sept. 1954, *MAB.*) *Subject Headings:* **1. Wind load on structures 2. Hurricane damage 3. Florida.**—*I.L.D.*

**7J–112** 551.515.2(676)

Sansom, H. W. (*comp.*) (*E. African Met. Dept.*), **The Lindi cyclone, April 15, 1952.** *East Africa High Commission. Meteorological Department, Memoirs*, 3(1), **1953.** 16 p. 3 figs., tables. Review by Rodewald, M., **Die LINDI-Zyklone.** [The Lindi cyclone.] *Wetterlotse*, No. 83:17–26, Feb. **1955.** 2 figs. Also: Hay, R. F. M., **Lindi cyclone of 15th April 1952.** *Marine Observer*, 24(166):232–233, Oct. **1954. DWB**—There has been no authentic report of the passage of a tropical cyclone from the Indian Ocean over the east coast of Africa since 1872. The cyclone described in this paper was short but intense. Its description is based mainly on eye witness reports and records obtained at Lindi (10°S) and aboard two ships. Rainfall amounts, pressure records and wind estimates are presented and the general development of the storm is described. (The first article was abstracted as 4.11–118, Nov. 1953, *MAB.*) *Subject Headings:* **1. Lindi Cyclone (1952) 2. Tropical cyclones in Southern Hemisphere 3. British East Africa 4. Indian Ocean.**—*G.T.*

**7J–113** 551.501.7:551.515.2

Sherman, Leon (*Fla. State Univ., Tallahassee*), **A proposed modification of hurricane reconnaissance procedures.** *American Meteorological Society, Bulletin*, 34(6):256–259, June **1953.** 3 figs., 6 refs. **DWB**—It is suggested that airplane reconnaissance flights in hurricane areas determine the "complete hurricane," that is the hyperbolic point as well as the storm center or point of cyclonic indraft. The relative position of the two points should give an index to movement, blocking or recurvature of the storm and whether the storm is developing or not. Observation of the rainfall pattern should also be included in flight plans and reports, since the area of heaviest rainfall should be the area of greatest addition of latent heat and energy which would be intensified by vertical motions (induced by added heat) and consequent indraft or entrainment. Concepts such as the locus of singularities (cyclonic indraft and hyperbolic points of wind field) are defined and illustrated schematically. (*Same item as* 6.9–82, Sept. 1955, *MAB.*) *Subject Headings:* **1. Hurricane reconnaissance procedures 2. Hyperbolic point of hurricane.**—*M.R.*

**7J–114** 551.515.2:656.61

Vickers, T. A., **Hurricane at Jamaica, August 1951.** *Marine Observer*, 23(160):112–113, April **1953. DWB**—Account of measures taken in Cable Ship "Norseman" to ride out hurricane of Aug. 16–17 in Kingston harbor. *Subject Headings:* **1. Hurricane, Jamaica (1951) 2. Marine navigation 3. Kingston, Jamaica.**—*C.E.P.B.*

## 1954

**7J–115** 532.59:551.515.2

Arakawa, H. (*Met. Res. Inst., Tokyo*), **On the pyramidal, mountainous, and confused sea in the right or dangerous semi-circle of typhoons.** *Papers in Meteorology and Geophysics*, Tokyo, 5(2):114–123, Sept. **1954.** 10 figs., 5 refs. **MH-BH**—Abstract only in: UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 1954, **Proceedings,** pub. **1955.** p. 53–54. **DWB**—Pyramidal waves in the "eye" of typhoons are described in many meteorological texts. Here, numerous examples are given in-

icating that the most dangerous, pyramidal, mountainous and turbulent seas are those found in ne right or dangerous semi-circle of typhoons, especially advancing at a high speed, and not those ound in the calm center. *Subject Heading:* **1. Typhoon waves.**—*Author's abstract.*

**7J–116** 551.515.2(74)

Boston Globe, Boston, Mass., **Hurricane Edition of Sunday Roto Pictorial Magazine, Sept. 9, 1954.** p. 7–34. diagrs., numerous photos. Contents include two signed articles: Whipple, harles, **Hurricane Carol—her wrath and wreckage,** and Bartlett, K. S., **The weather experts did heir very best to keep tabs on the elusive hurricane. DLC**—Numerous dramatic pictures of hurri- ane damage to boats, beach cottages, trees, power lines, towers, etc. in New England during Aug. 1, 1954 storm with comments on each page. Damage was estimated to be greater than that uffered in the Sept. 21, 1938 hurricane. *Subject Headings:* **1. Hurricane "Carol" (1954) 2. Hurri- ane damage photographs 3. New England.**—*M.R.*

**7J–117** 551.515.2(51)

Committee for the Researches of Earthquake and Typhoon Resisting Constructions, Taiwan, **nvestigations on Typhoon Kit and Rita, 1953.** Its *Memoirs*, No. 1. [1954?] 26+4 p. 74 hotos., 10 figs. In Chinese. **DWB**—Statistics, charts and photographs showing damage, path of storms and other features of typhoons that hit Formosa and the mainland of China and curved east- ward over Korea and the Sea of Japan. Emphasis is placed on structural damage to buildings nd other types of construction. *Subject Headings:* **1. Typhoon "Kit" (1953) 2. Typhoon "Rita" (1953) 3. Typhoon damage to structures 4. Formosa.**—*M.R.*

**7J–118** 551.515.2(52):532.593:550.342

*Daidoji, S.; Nakagawa, K. and Fukushima, T., **Swells and microseisms observed at Hachijo Island on the occasion of the typhoon "Agnes" on Nov. 6, 1952.** *Journal of Meteorological Research*, Tokyo, 5(10/12):747–751, Jan. **1954.** 4 figs., table, 7 refs. In Japanese, English summary p. 747. **DWB**—On the occasion of Typhoon "Agnes," which passed near Hachijo Island on Nov. 6, 1952, conspicuous swells and microseisms were recorded on the self-registering wave gage installed on the southwestern coast of this island and on the portable seismograph installed at the Hachijo Weather Station, respectively. In this paper descriptions are given of the amplitudes and periods of these swells and microseisms, and some discussion is included on their relations to meteorological condi- tions. (*Same item as* 6.9–160, Sept. 1955, *MAB.*) *Subject Headings:* **1. Typhoon microseisms 2. Typhoon swell 3. Typhoon "Agnes" (1952) 4. Hachijo Island, Japan.**—*Authors' abstract.*

**7J–119** 551.515.2:551.465

Daidoji, Shigeo; Unoki, Sanae and Kajiura, Kinjiro, **Waves at Hachijo Island caused by typhoon Tess and Alice in 1953.** *Journal of Meteorological Research*, Tokyo, 6(7):221–229, Sept. **1954.** 7 figs., 3 tables, 7 refs. In Japanese; English summary p. 221. **DWB**—In autumn, 1953, wave observations were carried out in two cases when typhoons were approaching Japan. The first case is when the path of a typhoon is on the western side at Hachijo Island and the second case is when the path is on the eastern side. In these two cases, the cirsumstances of wave attack against this island were quite different. In the first case only, a long wave with a period of about two minutes and about three meters in height was accompanied by wind waves, and this long wave may be some kind of oscillation generated by the mass transport resulting from very high wind waves and strong southerly wind. Refraction effect is found to be slightly large compared with the theoretical esti- mate, and this may be attributed to the variability of a wave direction but the detailed discussion is not yet possible. *Subject Headings:* **1. Typhoon waves 2. Wind waves 3. Typhoon "Alice" (1953) 4. Typhoon "Tess" (1953) 5. Hachijo Island, Japan.**—*Authors' abstract.*

**7J–120** 551.515.2:550.342

Donn, William L., **Relationship between microseism period and storm position.** *Science*, 119(3080):55–57, Jan. 8, **1954.** 3 figs., 2 tables, 2 refs. Also as: Columbia Univ. Lamont Geo- logical Observatory, Contract AF 19(122)-441, Technical Report on Seismology, No. 28, July **1953.** 10 p. 4 figs., ref. **DWB**—Microseism periods associated with fourteen hurricanes in the western North Atlantic, Caribbean Sea and Gulf of Mexico over a number of years have been plotted at the appropriate storm positions. Records from 15 stations were used although only a few may have recorded a particular microseism storm. The results show a definite period "flow" over the Gulf of Mexico, with "highs" generally southeast of Bermuda, and south of the continental shelf to the south of Newfoundland. A less prominent "high" occurs to the north of the West Indies arc. Inter- mediate periods exist between Bermuda and the east coast. Period seems to show a correlation with water depth. The variation with position seems to negate any significant ocean wave relation- ship. (*Same item as* 7I–128, Sept. 1956, *MAB.*) *Subject Headings:* **1. Microseismic storms 2. Hur- ricane microseisms 3. North Atlantic.**—*Author's abstract.*

**7J–121** 551.515.2(5

Hatakeyama, H. (*Met. Res. Inst., Tokyo*), **Recent researches on typhoons in Japan.** *Pape in Meteorology and Geophysics*, Tokyo, 5(2):101–113, Sept. **1954.** 7 figs., tables, 70 refs. **DWB**— Inhabitants in Japan suffer from strong winds and heavy rainfalls during typhoons almost eve year. Investigations on typhoons and depressions have been sedulously made by the investigato in the Central Meteorological Observatory and in the geophysical institutes of universities. I recent years, the development in the observational techniques with radiosonde and rawin has mac it possible to obtain reliable observational material in an area of a typhoon and even close to or eve in the eye of a typhoon. In the typhoon season of 1951, the Central Meteorological Observatory Japan started the Typhoon Research Project which included the aerological and extraordinar surface observations. In this paper the author reports on the recent researches on typhoons i Japan. *Subject Headings:* **1. Typhoon research 2. Typhoon observation 3. Japan.**—*Author abstract.*

**7J–122** 551.515:550.34

Heywood, Graham S. P., **Storm microseisms in Hong Kong. Preliminary Report.** *Hon Kong. Royal Observatory, Technical Notes*, No. 9, March **1954.** 5 p. fig., 2 refs. Mimeo. **DWB**— Microseisms with 4 or 5 sec. period recorded at the Royal Observatory on a Sprengnether ser. H seismometer recording only E–W movements during June 1952 to Dec. 1953 were analyzed wit respect to maximum range occurring within 30 min of each synoptic hour when range was >2 mi (enhanced microseisms). All synoptic charts and aircraft reconnaissance reports were examine and disturbances tabulated in area 10°–30°N and 105°–125°E, along with maximum winds an center of disturbance. All enhanced microseisms occurred when either monsoon winds (winter troughs, typhoons, tropical storms or "Kona" storms were in the area, but not all such storms pro duced microseisms. Charts show lines of equal amplitude for severe typhoons, less severe typhoon and tropical storms. Mechanism is uncertain but probably connected with surf. (*Same item a* 6.6–171, June 1955, *MAB.*) *Subject Headings:* **1. Microseisms from storms 2. Typhoon micro seisms 3. Hong Kong 4. China Sea.**—*M.R.*

**7J–123** 551.515.2:551.579.4

§Higgs, Ralph L. (*W. B. Airport Stn., San Juan, P. R.*), **Severe floods of October 12–15, 1954 in Puerto Rico.** *Monthly Weather Review*, Wash., D. C., 82(10):301–304, Oct. **1954.** 4 figs., 2 tables. **DWB, DLC**—One of the worst floods in the history of Puerto Rico occurred on Oct. 12–15, 1954. The heavy rainfall (26.07 in. fell at Toro Negro Dam during Oct. 11–16) responsible for the flood resulted from a circulation involving an east-west oriented shear line extending from Hurricane "Hazel" (west of Haiti) to the Leeward Islands region. Maps of rainfall and flood distribution of areas covered by flood warning are presented. Daily rainfall amounts (Oct. 11–16) for over twenty Puerto Rican stations and estimated flood damage figures are tabulated. The activity of the warning service is discussed briefly and termed timely and adequate. *Subject Headings:* **1. Hurricane floods 2. Hurricane "Hazel" (1954) 3. Puerto Rico.**—*G.T.*

**7J–124** 551.515.2:551.556.1:63

Honda, Chikayoshi, **An example of damages of rice plant by typhoon in the earing date.** *Journal of Agricultural Meteorology*, Tokyo, 9(3/4):101–102, Aug. **1954.** fig., 6 tables. In Japanese; English summary p. 102. **DWB**—The late rice plants hit by typhoon "Kezia," Sept. 13, 1950, during the earing period, were most seriously damaged. The damage done by this typhoon on rice grains is summarized as follows: 1) small brown discolored spots appeared on the surface of rice grains, especially in the late rice plants just in the earing period; 2) these damaged grains contained more green (unripe) and incomplete kernels and less complete, and also some brown kernels, but no deformed kernels were observed; 3) the weight of 1000 kernels of damaged grains decreased about 5%; 4) this damage to grain was more serious in glutinous rice than in nonglutinous. (*Same item as* 7.4–149, April 1956, *MAB.*) *Subject Headings:* **1. Typhoon damage to crops 2. Typhoon "Kezia" (1950) 3. Rice yield 4. Japan.**—*Author's abstract.*

**7J–125** 551.515.23(713)

Hornstein, R. A. (*Dominion Public Weather Office, Halifax, N. S.*), **Hurricanes.** *Royal Meteorological Society, Canadian Branch, [Publications]*, 5(5), Dec. 2, **1954.** 14 p. diagr. **DWB**— Naming of hurricanes and typhoons, history of hurricane knowledge, forecasting problems, and the particulars of hurricane "Hazel" (1954) which did so much damage in Toronto, are reviewed in this nontechnical lecture. Other hurricanes which affected Canada are mentioned and a chart showing paths of "Hazel" and other erratic hurricanes appended. *Subject Headings:* **1. History of hurricanes 2. Hurricane forecasting 3. Hurricane "Hazel" (1954) 4. Toronto, Canada.**—*M.R.*

7J–126 551.556:551.481.1 551.515:525.63

†Kivisild, Hans R., **Wind effect on shallow bodies of water with special reference to Lake Okeechobee.** *Stockholm. Tekniska Hogskolans. Vattenbyggnds-institutionen, Bulletin,* No. 43, **1954.** 6 p. 14 plates, bibliog. p. 138–144, numerous eqs. **DWB**—This monograph comprises a systematic and thorough review of previous studies on wind effects on shallow bodies of water, seiches, etc., and an analytical and synthetic attempt to formulate a theory of such wind effects with special application to Lake Okeechobee, Fla. Finally, detailed data for 5 hurricanes (1945–50) which affected Lake Okeechobee are analyzed and presented as a test of the theory. Field as well as model tests are used to determine a formula for hydrodynamic drag of a free water surface. Hurricane data cited lead to conclusion that turbulence mixing length $m = 0.15$ cm should be used instead of $m = 0.2$ cm in the wind force portion of the formula. A triangular grid is recommended for similar studies. Meteorological factors are considered at some length. Profiles are presented graphically. (*Same item as* 6.2–9, Feb. 1955, *MAB.*) *Subject Headings:* **1. Wind effects on shallow water 2. Hurricane tides 3. Mixing length coefficients 4. Lake Okeechobee, Fla.**—*M.R.*

7J–127 551.506(73) 551.515.2

Ludlum, David M., **Weatherwatch: Summer 1954—heat and hurricanes.** *Weatherwise,* (5):134–135, Oct. **1954.** 4 figs. Also his: **Weatherwatch: Autumnal heat and hurricanes.** *Ibid.,* (6):150–153, Dec. **1955.** 5 figs. **DWB**—In the first article maps show departure from normal of temperature and precipitation in July and Aug., 1954. The general circulation pattern leading to the extreme heat and drought are explained. A short account of the disastrous hurricane "Carol" which went over New England without adequate warning is given. The second article discusses the Sept. 1955 heat in southern and central U. S.; record heat at Los Angeles in early Sept. (110°F on Sept 1 and 108° on Sept. 2); Connecticut flood of Oct. 14–17, 1955; and fall hurricanes "Gladys," "Flora," "Hilda," "Ione" and "Janet," with charts to show details of temperature and precipitation distribution and path of hurricane "Ione" across North Carolina (Sept. 19–20, 1955) with fixes every hour or so. "Janet" in late Sept. left 60,000 homeless in Yucatan just 10 days after "Hilda" had devastated the same area, leaving >300 dead in the 2 storms. *Subject Headings:* **1. Extreme temperature-hurricane relationships 2. Hurricane "Carol" (1954) 3. Hurricanes, 1955 4. Yucatan, Mexico 5. United States.**—*A.A., M.R.*

7J–128 551.515.2

*Mason, A. H.; Thomas, M. K. and Boyd, D. W., **The October 15–16, 1954 storm, "Hurricane Hazel" in Ontario.** Canada. Meteorological Division, CIR-2606, TEC-210, Jan. 21, **1955.** 41 p. figs., 10 tables, ref. **DWB**—Also: Clinch, R. L. and Saaltink, H. J. (*both, H. G. Acres & Co., Ltd., Niagara Falls, Ontario*), **Review of flood problems in the wake of Hurricane Hazel.** *Engineering Journal,* Montreal, 38(8):1057–1062, Aug. **1955.** 5 figs., table. **DLC**—The Meteorological Division report contains a complete statistical analysis of all available precipitation, wind, temperature, pressure and storm track data for "Hazel" (1954) which caused great flooding and loss of life in Toronto and vicinity. Catastrophe was due to 6″ to 8″ of rain following on already saturated ground when the dying hurricane passed directly over Toronto. All tropical storms (24 of which 17 gave excessive rainfall) which affected Ontario from 1900–1949 are plotted and discussed with reference to rainfall along their paths. About one out of 14 hurricanes affected Ontario. Excessive precipitation is shown to occur in a narrow band (not over 100 mi wide). Most dangerous are hurricanes which move inland parallel to a cold front. The article in **Engineering Journal** is a summary of the above, stressing the need for engineers to extend the rational hydrometeorological studies made for the U. S. to Canada and to improve present knowledge of flood rainfall possibilities. *Subject Headings:* **1. Hurricane "Hazel" (1954) 2. Hurricane floods 3. Hurricane precipitation 4. Ontario, Canada.**—*M.R.*

7J–129 551.515.2:627.52

Myers, Vance A., **Characteristics of United States hurricanes pertinent to levee design for Lake Okeechobee, Florida.** *U. S. Weather Bureau, Hydrometeorological Report,* No. 32, March **1954.** 106 p. 53 figs., 12 tables, 21 refs., 12 eqs. **DWB**—This report describes the development of meteorological concepts and techniques which, in combination with oceanographic techniques, can provide design values for the levees on the shores of Lake Okeechobee. The techniques for analyzing wind and pressure data in selected hurricanes, involving the determination of wind speed profiles, wind-direction spirals and speed of movement, the reconstruction of winds and that of storms prior to water-stage recorders, and the transposition of hurricanes are described. The application of these techniques and analyses to evaluating the characteristic and resultant wind fields over Lake Okeechobee is illustrated. The results of the analyses are represented graphically. (*Same item as* 7I–148, Sept. 1956, *MAB.*) *Subject Headings:* **1. Levee design 2. Hurricane design loads 3. Wind effects on lake levels 4. Lake Okeechobee, Fla.**—*I.L.D.*

**7J–130** 551.515.2(7

Narragansett Times, Wakefield, Rhode Island, **Carol was here: a pictorial chronicle of hurricane in South County, Aug. 31, 1954.** Sept. 1954. 36 p. mostly photos. Also: Providen Rhode Island Journal, **Hurricane Carol lashes Rhode Island, Aug. 31, 1954.** Pub. by the Providen Journal Co., 1954. 80 p. mostly photographs. **DWB**—Vivid pictorial and descriptive accounts flood and damage to Rhode Island caused by hurricane "Carol" on Aug. 31, 1954. Amount a type of damage, warning and rescue activities are discussed. (For fuller abstracts, *see* 7.4–151 a 7.4–153, April 1956, *MAB.*) *Subject Headings:* **1. Hurricane "Carol" (1954) 2. Hurricane dama photographs 3. Rhode Island.**—*G.T.*

**7J–131** 551.509.5:551.515.2(26

Rodewald, Martin, **Taifun-Warnungen im Nordpazifik.** [Typhoon warnings in the Nor Pacific.] *Wetterlotse*, No. 70:81–86, May 1954. **DLC**—Account of typhoon warnings issued navy stations at Guam and Stanley Point. The precision of the statements of position of cent track, forecast position and limits of storm zone are very valuable to shipping. (*Same item* 6.1–95, Jan. 1955, *MAB.*) *Subject Headings:* **1. Typhoon warnings 2. North Pacific.**—*C.E.P.B.*

**7J–132** 551.515.2:656

Rodewald, M., **Die "Toya Maru"-Katastrophe.** [The Toya Maru catastrophe.] *Wetterlots* No. 77:215–216, Oct. 1954. **DLC**—Brief account of damage by typhoon "Marie" which sar "Toya Maru" on Sept. 26, 1954. *Subject Headings:* **1. Typhoon "Marie" (1954) 2. Marine di asters.**—*C.E.P.B.*

**7J–133** 551.515.2(74

Sable, Edward, **Hurricane Edna, Sept. 11, 1954.** Boston, U. S. Weather Bureau, 1954. 2 **DWB**—Hurricane "Edna" caused 16 deaths and $40,600,000 property damage over New Engla as a whole. It did not hit as directly as "Carol" did 12 days before and the population was bett prepared. A table gives lowest pressure (in. and mb) and time, peak gust velocity and time (an fastest mile of wind), and total rainfall at 40 stations in Maine, N. H., Mass., R. I., Conn. and N. Y Lowest pressure was 27.77 (940.4 mb) at 1:53 p.m. at Woods Hole, Mass. Peak wind was 120 mp NW at 3 p.m. at Martha's Vineyard and 87 mph for 1 min. at Block Island, R. I. *Subject Heading* **1. Hurricane "Edna" (1954) 2. Hurricane damage 3. Hurricane statistics 4. New Englan** —*M.R.*

**7J–134** 551.515.2:551.556.1(74

**Three hurricanes: what did we learn?** *Factory Mutual Record*, Boston, 31(11):3–5, Nov. 1954 photos, diagr. **DWB**—Paths of hurricanes "Edna," "Carol" and "Hazel" (Aug. 31–Oct. 15, 1954 are shown on a map of the East Coast of the U. S. and compared with 1938 and 1944 paths. Damage to factories in New England caused by "Edna" and "Carol" is summarized and discussed. Un anchored roofs provided the greatest source of damage or loss. Poorly designed walls and window also provided a major source of damage. *Subject Headings:* **1. Hurricanes, New England (1954 2. Hurricane damage prevention 3. New England.**—*M.R.*

**7J–135** 551.526:551.515.2(52)

Uda, Michitaka (*Tokyo Univ. of Fisheries*), **On the variation of water temperature due to the passage of typhoon.** *I.U.G.G. Association of Physical Oceanography, Rome, Sept. 14–25, 1954: Procès-Verbaux.* Bergen, 1954. p. 297–298. **DWB**—Observational data of variations of water temperature caused by the passage of typhoons in water adjacent to Japan show that these variations are due to turbulent mixing and horizontal transport of water masses. On two occasions, typhoons on Sept. 21, 1934 and Oct. 5–6, 1949, temperatures rising gradually attained their maximum in from 2–3 days respectively, and 32 hrs before the passage of the typhoon centers. In the third case, in the Bungo Strait, a marked rise of water temperature from 1 to 4°C took place after the passage of the typhoon center. In the latter case the variation of water temperature was remarkable by the horizontal transport. *Subject Headings:* **1. Water temperature variations 2. Typhoon effects on water temperature 3. Japan.**—*A.M.P.*

**7J–136** 551.515.2

**Wind and fury, 1954: a story of people helped and of those who gave help.** *American National Red Cross, Eastern Area, Pl-216*, 1954. unpaged. numerous photos. **DWB**—Case histories of spontaneous and organized rescue work and of Red Cross help in New England in connection with hurricanes "Carol" and "Edna" in 1954. *Subject Headings:* **1. Hurricanes 2. American National Red Cross.**—*G.T.*

1955

**7J-137** 551.515.2

Adler, Irving (pend., Robert Irving) **Hurricanes and twisters.** Foreword by Ernest J. Christie. [Illus. by Ruth Adler. N. Y., Knopf, **1955.** 143 p. diagrs., photos. **DLC**—An easily understood account of the world's most famous hurricanes or typhoons and storm tide disasters in history, with simple schematic diagrams and explanations of the mechanics or thermodynamics of hurricane genesis and movement, recurvature, etc. Tornadoes, hailstorms, tidal waves (tsunamis), willy-willies and Bay of Bengal cyclones are also mentioned or described. Modern methods of detecting, tracking, reporting and forecasting hurricanes, especially in the Caribbean and U. S., are emphasized. Deaths due to hurricanes or tropical cyclone waves have several times reached 100 to 300 thousand people. (*Same item as* 7I-155, Sept. 1956, *MAB.*) *Subject Headings:* **1. Hurricane damage 2. Hurricanes 3. Tornadoes 4. Bay of Bengal cyclones.**—*M.R.*

**7J-138** 551.579.4:627.51

Aki, Koichi (*Tokyo Univ.*), **Some problems on flood control in Japan.** (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 1954, **Proceedings,** pub. **1955.** p. 17–21.) **DWB**—The majority of floods are caused by heavy rainfall accompanying typhoons. The damage is estimated at almost fifty billion yen annually. Flood control efforts in Japan are reviewed. (For fuller abstract, *see* 6.11-313, Nov. 1955, *MAB.*) *Subject Headings:* **1. Typhoon rainfall 2. Typhoon damage 3. Flood control 4. Japan.**—*From author's abstract.*

**7J-139** 551.515.2:550.342

Arakawa, Y. (*Matsushiro Seismological Obs.*), **On the microseisms caused by a typhoon.** *Japan. Central Meteorological Observatory, Tokyo, Quarterly Journal of Seismology,* 20(3):123–127, Dec. **1955.** figs., table, 3 refs. In Japanese; English summary p. 123. **MH-BH**—Microseisms caused by Typhoon No. 14, Sept. 1954 were investigated, using the seismograms obtained at Matsushiro, Nagano and Matsumoto. The present data were given by the records of 1 ton seismographs of C.M.O. type at Matsushiro, Wiechert's seismograph at Nagano and a portable seismograph at Matsumoto (instrumental constants are shown in table). Change of amplitudes and periods of microseisms were considered in relation to the location of the typhoon. When the typhoon is over the ocean south or southwest of Honshu, the periods of microseisms are 7–8 sec at Matsushiro and 3–5 sec at Nagano and Matsumoto. However, as the center of the typhoon advanced towards northeast from the Boso Peninsula, the periods of major waves turned into 4–5 sec at each of those three stations. *Subject Headings:* **1. Typhoon microseisms 2. Japan.**—*Author's abstract.*

**7J-140** 551.515.2(74/75)

Benton, George S. (*Johns Hopkins Univ.*), **More hurricanes in your future.** *Johns Hopkins Magazine,* Baltimore, 7(1):6–7, 29–32, Oct. **1955.** fig., port. **DLC**—A popular or semitechnical article on hurricanes of 5 types which affect the Atlantic Coast States. The Cape Verde storms (Type I) which carry the greatest potential destructive power, usually strike the Gulf Coast, whereas Type IV storms (West Indies) strike Florida or the Carolina Coast or recurve to sea without striking the coast. Recently the hurricanes have more frequently affected the North Atlantic and New England States. Up to 20 years ago they seldom penetrated north of Cape Hatteras. Hurricanes are increasing in number too, according to the author. Paths of the different types and examples of notorious hurricanes up to 1955 are cited and illustrated. *Subject Headings:* **1. Hurricane types 2. Hurricane tracks 3. Atlantic Coast of United States.**—*M.R.*

**7J-141** 551.508.57:551.515.23

Bielinski, Leo S. (*N. Y.*), **A tropical-cyclone tracking device utilizing the inflow at low levels within the eye.** *American Meteorological Society, Bulletin,* 36(6):292–294, June **1955.** 4 figs., 2 refs. **DLC, DWB**—A description of the construction and operation of "Typhoon Homer," a device for tracking tropical cyclones by dropping a "semi-free floating" balloon with attached radiotransmitter into the eye and then fixing the position of the eye with radio detection finding stations. A photograph of the device and diagram showing its operation are presented. *Subject Headings:* **1. Hurricane tracking devices 2. "Typhoon Homer" 3. Radio storm detection.**—*I.L.D.*

**7J-142** 551.515.2(713)

Boughner, C. C., **Hurricane Hazel.** *Weather,* 10(6):200–205, June **1955.** 2 figs. **DWB**—The hurricane season of autumn 1954 was unusually severe along the Atlantic coast, culminating in "Hazel." This appeared in E. Caribbean on Oct. 5 and, blocked by an anticyclone over N. Atlantic, travelled from N. Carolina to S. Ontario in 12 hrs on Oct. 15–16, doing great damage through wind and heavy rain. Details of flooding around Toronto are given, especially in Humber River. At Brampton 7¼ in. fell in 24 hrs and over 8 in. in 48 hrs (map). (*Same item as* 6.9–159, Sept. 1955, *MAB.*) *Subject Headings:* **1. Hurricane "Hazel" (1954) 2. Toronto, Canada.** –*C.E.P.B.*

**7J–143** 551.515.23(7

Dunn, Gordon E.; Davis, Walter R. and Moore, Paul L. (*W. B. Office, Miami, Fla.*), **Hurricane of 1955.** *Monthly Weather Review*, Wash., D. C., 83(12):315–326, Dec. **1955.** 9 figs., table, 7 re **DWB**—Thirteen tropical storms, 10 of which were of hurricane force, occurred in 1955, nearly equ ing record of 11 hurricanes in 1950. Theory of NAMIAS and C. R. DUNN (1955) regarding planet circulation anomaly resulting in high frequency of hurricanes of anomalous path is shown to similar to that of GARRIOTT (1906), though more sophisticated. Hurricanes of 1955 proved t most disastrous in history and broke all records for damage for the second consecutive year—over billion dollars in damage and 218 killed in U. S. alone, and 1518 killed and over two billion dolla damage, all told, from Atlantic hurricanes. Individual hurricanes are described and dropson temperatures near and in eye in "Connie" and "Diane" reproduced. Barograph trace for "Jane at Chetumal, Mexico shows record (extrapolated) to 27.00". Radar reports of "Connie," "Dian and "Ione" are analyzed and illustrated and tracks of all storms shown on chart. Frictional i fluences were found to cause a left turn in 3 hurricanes. *Subject Headings:* **1. Hurricanes, 19 2. Hurricane damage 3. Hurricane tracks 4. Dropsonde observations.**—*M.R.*

**7J–144** 551.509.52:551.515

Ewing, Ann, **Hurricane season approaching.** *Science News Letter*, Wash., D. C., 67(25):39 395, June 18, **1955.** photo. **DLC**—Electronic computers will be used in 1955 for the first tim to help predict hurricane paths. However, the hurricane is too small a phenomenon to be easi forecast by these machines. They can predict the general circulation which steers the storm Radar has been installed at Hatteras to detect storms which might hit the North Atlantic Coast the U. S. The Weather Bureau program for 1955, and girls names assigned for use in 1955 a outlined and listed. *Subject Headings:* **1. Hurricane forecasting program 2. U. S. Weather Bureau Hurricane Warning Service.**—*M.R.*

**7J–145** 551.55:551.515.2(51

Fogg, J. K. and Wang, Griffith (*Civil Air Transport, Taipei, Formosa*), **Effects of typhoons a Taipei and Tainan, Formosa.** (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 195 **Proceedings,** pub. **1955.** p. 1–9. charts, table.) **DWB**—A discussion is made of the topographica effect upon typhoon induced winds at Taipei and Tainan, Formosa. Statistical data is used t construct charts containing isopleths of resulting wind force at Taipei and Tainan when typhoon are in the proximity. The forecasting value and significance of these charts are explained. *Subje Headings:* **1. Typhoon winds 2. Orographic effects 3. Formosa.**—*Authors' abstract.*

**7J–146** 551.515.2:551.461.

Gherzi, E., **Peculiar stratified shape of typhoon waves.** *Marine Observer*, 25(170):239–240 Oct. **1955. DLC**—Describes well-defined steps in waves from the trough half way up their height sometimes as many as 20, remaining steady. High harmonics of the period of typhoon squall are suggested as the cause. *Subject Heading:* **1. Typhoon waves.**—*C.E.P.B.*

**7J–147** 551.512.2:633.18

Hayami, I. and Oka, C., **On the "Shiraho" damage of paddy rice caused by the Typhoon June (No. 5412) in Oita Prefecture.** *Japan. Central Meteorological Observatory, Tokyo, Memoirs of Industrial Meteorology*, 19(1):1–9, Dec. **1955.** 7 figs., 2 tables. In Japanese; English summary p. 9 **DLC**—Typhoon "June" passed through Kyushu District from south to north between the evening of Sept. 13, 1954 and early next morning. After this period of only one night the ears of immature rice plants in Oita District became white (the so-called "Shiraho" damage). In this paper it is shown that the "Shiraho" outbreak was due to the southwest winds of high temperature and low humidity which were the air currents in the rear of the typhoon (becoming föhn winds because of the mountain chains of Kyushu District). *Subject Headings:* **1. Hurricane damage to rice 2. Typhoon "June" (1954) 3. Kyushu District, Japan.**—*Authors' abstract.*

**7J–148** 551.515.2:551.556:69

Heywood, Graham S. P. (*Hong Kong*), **Pressure of typhoon winds on structures.** (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 1954, **Proceedings,** pub. **1955.** p. 11–15. 5 tables.) **DWB**—The effects of hurricane winds on buildings and other structures are not yet fully understood, and this paper gives a brief survey of the problems involved. Turbulence in high winds is first considered; gusts recur at irregular intervals of the order of 10 sec, and from this it is estimated that the lateral extent of the eddies causing these gusts is of the order of 1000 ft. A gust may therefore affect the whole face of a large building simultaneously. The presence of heavy rainfall increases the pressure exerted by the wind, but it is estimated that this increase amounts to only about 3% even in the heaviest downpours. An estimate is given of the pressure exerted on a plane surface by a gust of 130 kn, and some mention is made of the distribution of pressure and suction

ver different parts of a building. The effect of fluctuating forces on nonrigid structures is considered; there is a possibility that fatigue may occur after a long period in structures exposed to strong gusty winds, but owing to the irregularity of the gusts there does not seem to be any danger of resonant vibrations being set up. Knowledge of the structure of eddies in high winds could be obtained by means of an array of sensitive anemometers, and more accurate observations of the rate of rainfall in typhoons could be made by means of a rainfall intensity recorder installed with its rim flush with the ground. Wind tunnel experiments are needed to determine the effects of airstreams on models of different types of buildings. (*Same item as* 7.3–72, March 1956, *MAB.*) *Subject Headings:* **1. Typhoon pressure 2. Wind pressure on buildings 3. Hurricane winds.**—*Author's abstract.*

**7J–149** 551.515.2:551.461.2:525.63(521.27)

Hisamoto, S., **Meteorological high tide in Tokyo Bay due to typhoon.** *Journal of Meteorological Research*, Tokyo, 7(4):201–205, June **1955.** 2 figs., 5 tables, eqs. In Japanese; English summary p. 201. **DWB**—We investigated statistically the frequency of high tide whose height exceeds a certain height, say 300 cm or 350 cm, at Reigan-jima Tide Gage Station, Tokyo, based on the data during 1926–1952. From the above result, it may be concluded that a high tide exceeding 300 cm, 350 cm and 400 cm may be expected to occur every 13, 70 and 300 years, respectively. *Subject Headings:* **1. Hurricane tides 2. Typhoon effects 3. Tokyo, Japan.**—*Author's abstract.*

**7J–150** 551.515.2(75,76):551.461.2

Hubert, L. F. and Clark, G. B. (*U. S. W. B., Wash., D. C.*), **The hurricane surge: an interim report.** U. S. Weather Bureau, June **1955.** 34 p. 20 figs., 12 refs., 2 eqs. **DWB**—The hurricane surge (not a true tide because it is not rhythmical) is defined and the difference between the hurricane surge and the extratropical storm surge (as covered in a special bibliography, *see,* 6(3):370–392, March 1955, *MAB*) is pointed out as mainly due to the curved wind field and highly concentrated area of high winds. There are 3 surge producing forces: 1) set-up by wind driven water, 2) convergence of wind driven currents, 3) barometric effect—also concentration of wave energy by reflection and funneling, seiches and shoaling are discussed from a theoretical and practical viewpoint. Histories of 16 hurricane-associated surges (1900–1949) along the Atlantic and Gulf Coasts are reviewed and details for each shown on separate charts. (*Same item as* 7I–163, Sept. 1956, *MAB.*) *Subject Headings:* **1. Hurricane surges 2. Atlantic Coast of United States 3. Gulf Coast.**—*M.R.*

**7J–151** 551.515.2(261,265)

**Typhoon, East China Sea.** *Marine Observer*, 23(161):139–140, July **1953.** table. Also: **Hurricane, North Atlantic Ocean.** *Ibid.*, 25(170):212, Oct. **1955.** Also: **Hurricane Diane, North Atlantic Ocean. Hurricane Edith, North Atlantic Ocean. Hurricane Ione, North Atlantic Ocean. Typhoon Iris, West Pacific Ocean.** *Ibid.*, 26(173):138–142, July **1956. DLC**—Reports of the weather and sea in tropical storms and accounts of warnings. The remarkable break-up of "Ione" after reaching land near Cape Hatteras is noted. Detailed reports are given on "Iris." *Subject Headings:* **1. Hurricane account 2. Typhoon account 3. North Atlantic 4. Western Pacific 5. China Sea.**—*C.E.P.B.*

**7J–152** 551.515.2:629.13(046)

**Hurricane hunters.** *The Star Pictorial Magazine*, Wash., D. C., Sept. 11, **1955.** p. 10, 12. Photos. **DLC**—Pictures of hurricane reconnaissance crew preparing for flight at Jacksonville, a ship caught in a hurricane at sea, and operations within the reconnaissance plane while in flight. *Subject Headings:* **1. Hurricane reconnaissance 2. Hurricane photographs 3. Newspaper articles.**—*M.R.*

**7J–153** 551.515.2(74/75)

**Hurricanes: they cost even when they fizzle.** *Business Week*, Aug. 20, **1955,** p. 32–33, 152. Offset reproduction of separated sheets. photo. **DWB**—The fact that great economic loss is suffered even when a hurricane does only moderate physical damage, is brought out in a vivid way by quoting estimated losses from preparations, cancelled vacations, employees dismissed from work, etc. A day-by-day account of events associated with hurricane "Connie" from Aug. 6 to Aug. 13, 1955, is given and the position of the storm from Aug. 4–12 shown on a global projection. Damage totals about $15 million and 42 lives lost. Rains of >12" in New York area caused great inconvenience. *Subject Headings:* **1. Hurricane damage 2. Hurricane "Connie" (1955) 3. Atlantic Coast of United States.**—*M.R.*

**7J–154** 551.515.8:551.515.2

Ligda, Myron G. H. (*Texas A. & M. College*), **Hurricane squall lines.** *American Meteorological Society, Bulletin*, 36(7):340–342, Sept. **1955.** 4 figs., 2 refs. **DWB, DLC**—Are the outer precipitation bands of hurricanes and typhoons important phenomena? In suggesting that the answer to

this question is "yes," several features of these bands are described or postulated. Methods estimating the severity of attendant weather conditions by radar observation are offered. *Subj Headings:* **1. Hurricane squall lines 2. Radar observation of hurricanes.**—*Author's abstract.*

**7J–155** 551.515.2:551.509

Miller, Edward (*Dominican Republic*), **A plan for the organization of a hurricane warni system in the Dominican Republic.** *World Meteorological Organization, WMO Bulletin*, 4(3):12 126, July **1955.** photo, 4 refs. **DWB**—Under U.N. Technical Assistance Program, the Dominic Republic is developing a service to make local application of warnings from hurricane warning cente and to develop an efficient warning system. The program started in 1954. Warnings are receiv from the U. S. Weather Bureau office in San Juan, P. R., and transmitted by telegraph to Centr Meteorological Office at Ciudad Trujillo. Issuance, dissemination, and precautionary measur for protection of life and property are discussed in separate sections, and floods in the 1954 hurrica season are summarized. *Subject Headings:* **1. Hurricane warning services 2. Dominican Repub Meteorological Service.**—*M.R.*

**7J–156** 551.515.2:551.553.8(74/7

Mook, Conrad P., **The distribution of peak wind gusts in hurricane Hazel 1954.** *Weatherwi* Boston, 8(4):92–96, Aug. **1955.** 9 figs. numerous tables. **DWB, DLC**—Hurricane "Hazel" Oct. 15, 1954 was unusual in that it maintained its energy after passing onto the continent, so hour wind speeds could be observed over a dense network of stations. Isobaric charts for each ho from 1130 to 1830 with shading for area bounded by 50 kn isotach show that destructive gales o curred far in advance of storm center. Tables showing dew points, wind directions and spe indicate passage of cold, warm and occluded fronts from North Carolina to Virginia. These fron shown in charts evidently occur quite often and are associated with areas of peak gusts. Chart Eastern United States shows two sets of isochrones of time of occurrence of peak gusts which can in two waves, the second overtaking the first over New Jersey and Pennsylvania. *Subject Headin* **1. Hurricane "Hazel" (1954) 2. Hurricane fronts 3. Hurricane wind maxima 4. Eastern Unit States.**—*M.R.*

**7J–157** 551.515.2(74/7

Mook, Conrad P., **Hurricanes entering U. S. mainland—Hatteras to Brownsville, 1896–195** *Weatherwise*, Boston, 8(3):71–72, June **1955.** chart. Also his: **Hurricanes . . . —Eastport Hatteras, 1635–1955.** *Ibid.*, 9(4):124–125, Aug. **1956.** Chart, 5 refs. **DWB**—Charts show exa points of entry of 84 hurricanes and dates thereof. Brief text specifies sources of data. *Subj Headings:* **1. Hurricane statistics 2. Atlantic Coast of United States.**—*M.R.*

**7J–158** 551.515.2(75

North Carolina. Council of Civil Defense, **Long-Range Hurricane Rehabilitation Projec** Raleigh, North Carolina, Dec. **1955.** 64 p. figs., photos, diagrs. (some fold.). **DWB**—An elegan brochure giving the salient facts about the four hurricane floods that inundated the tide water ar of North Carolina during hurricanes "Hazel" (Oct. 1954), "Connie" and "Diane" (Aug. 1955 and "Ione" (Sept. 1955). The tracks and details of these four, and of other hurricanes affectin the area are shown on colored charts and in tables and text. A group of charts show number an path of storms in each decade from 1879–1955 (36 of the 67 hit the Carolina Coast and 31 veere to sea) averaging one each two years. Danger sectors of hurricanes, areas affected in different way by different storms and damage to beaches are shown in elaborate charts; numerous full page photo graphs show flood and damage to cottages, fisheries, forests, crops, beaches and farms. Protectio warning and rehabilitation measures, both during the past two years and for the future, are give major emphasis. The fact that an adequate warning and forecast system can save a great de of life and property, but cannot prevent hurricanes or floods, is stressed. *Subject Headings:* **1. Hurr cane damage 2. Hurricane tracks—Atlantic Coast 3. Hurricane floods 4. North Carolina.**—*M.*

**7J–159** 551.515.2(52):551.556

Ōkubo, I., **On salty wind injury in Hakodate City and its vicinity, caused by the "Typhoo 5415," September 1954.** *Japan. Central Meteorological Observatory, Tokyo, Memoirs of Industri Meteorology*, 19(1):11–14, Dec. **1955.** 3 figs., table, 3 refs. In Japanese; English summary p. 1 **DLC**—The author examined the salty wind injury caused by "Typhoon 5415" in Hakodate City an its vicinity, principally investigating the salinity of the leaves of trees. The following results ar reported: (1) The injury is caused not only by super-transpiration but also by the salinity brough by the strong wind, so that the leaves of trees such as poplar, chestnut and cherry withered suddenly changing their color after the typhoon passed. (2) The quantities of salt obtained from the leave are from 2 to 10 mg per leaf. (3) Salty wind injury in a densely populated district is less than a

her places. (4) The injury is heavier in the valleys than on hill tops. (5) It is heavier on the indward side than on the leeward side. *Subject Headings:* **1. Hurricane wind damage 2. Typhoon 15** "June" **(1954) 3. Hakodate, Japan.**—*Author's abstract.*

**7J–160** 551.509:551.515.2:351.71

Patterson, J. R. (*U. S. Representative, Connecticut*), **H.R. 5260, "the Hurricane Bill."** *Weatherwise*, Boston, 8(3):63, 82, June **1955.** port. **DWB**—Details of bill which would provide $5 million o carry out a 10 point hurricane warning service by U. S. W. B. from Maine to Texas are presented. *ubject Headings:* **1. Hurricane warning legislation 2. U. S. W. B. appropriations.**—*M.R.*

**7J–161** 551.515.2:551.579.4(691)

Pelleray, H. (*Electricité de France*), **Le cyclone tropical du 14 au 22 Janvier 1954 a Madagascar.** Tropical cyclone of Jan. 14–22, at Madagascar.] *Annuaire Hydrologique de la France d'Outre-Mer*, 953, p. 67–75. pub. **1955.** 4 figs., eqs. **DWB**—The cyclone appeared from the Indian Ocean nd crossed the coast of Madagascar between Tamatave and Vatomandry, with a speed of 8 mph, nd winds of 160 mph at sea and 100 mph on the plateau. The storm passed toward the WSW, bout 60 km south of Tananarive. Rains began on about the 12th and continued until the 19th Jan. In places on the western coast the rain amounted to about 200 mm (8″) in 24 hr. Details rainfall, runoff and floods in various basins and numerous places are given in text and on charts nd graphs. The flood is considered a 50-year flood in the plain of Tananarive. *Subject Headings:* **Tropical cyclone, Madagascar (1954) 2. Hurricane floods, Madagascar 3. Madagascar.**—*M.R.*

**7J–162** 551.515.2:551.461.23(74/75)

*Redfield, Alfred C. and Miller, A. R., **Memorandum on water levels accompanying Atlantic oast hurricanes.** Prepared at the request of the U. S. Weather Bureau, June 1, **1955.** 14 p. 8 figs., ble, 22 refs. **DWB**—The tidal effects due to the hurricanes of Sept. 21, 1938, Sept. 14–15, 1944 nd "Carol," "Edna" and "Hazel" of Sept. and Oct. 1954 are analyzed for the Atlantic Coast from atteras to Maine, to show the relative importance of barometric effects, forerunners, hurricane rge and the resurgence or oscillatory rises and falls that follow the main surge. These are nicely ustrated by tidal records at different points and other data from the storms. In the deep sea the rometric effect is preponderant. Only over shallow coastal or island embayments is the surge preciable. Therefore local topography must be studied in connection with theoretical or empirical curves applied by analogy. (*Same item as* 7.1–214, Jan. 1956, *MAB.*) *Subject Headings:* **Hurricane tides 2. Atlantic Coast of United States.**—*M.R.*

**7J–163** 551.501.7:551.507.352:551.515.2

Riehl, Herbert (*Chicago Univ., Ill.*), **Hurricane reconnaissance tracks.** *American Meteorological Society, Bulletin*, 36(6):291–292, June **1955.** 2 figs., ref. **DLC, DWB**—The author suggests the use reconnaissance aircraft on hurricane tracks at 500 mb level in order to determine conditions in eas bordering on the storms as well as in the center of hurricane. A staging base in Bermuda is commended. The suggested reconnaissance trail and the 500 mb contour on specific dates are own. *Subject Headings:* **1. Hurricane reconnaissance 2. Aircraft weather reconnaissance.** *I.L.D.*

**7J–164** 551.515.2:551.507.13

Sherman, Leon (*Florida State Univ., Tallahassee*), **Proposal for the use of SOFAR signals for the porting of hurricane positions.** (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 54, **Proceedings,** pub. **1955.** p. 245–246.) **DWB**—It is proposed that a test of the use of SOFAR nals for the reporting of hurricane positions be made. *Subject Headings:* **1. Hurricane location SOFAR.**—*Author's abstract.*

**7J–165** 551.515.2:551.501.7:551.507.352

Sherman, Leon, **Reconnaissance of the "complete" hurricane.** (In: UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 1954, **Proceedings,** pub. **1955.** p. 109–119. 13 figs., 7 refs.) lso in: *American Meteorological Society, Bulletin*, 36(4):152–158. April **1955. DWB**—The "complete" tropical cyclone includes a particular hyperbolic point as well as a cyclonic indraft point. e two arise simultaneously, are linked by the "locus of singularities" throughout the lifetime of storm and disappear together. The principal initial hurricane band is probably associated with axis of dilation extending from the hyperbolic point (in the field of relative motion) to the cyclonic ter. Their separation is a proper measure of the extent of the disturbance. Particularly for small rms, their orientation helps define the direction of the "steering" current of storm movement. s possible to locate the hyperbolic point from the air through the use of smoke bombs; in the case small storms this and eye penetration can be accomplished in the course of a single flight. Such

a flight will usually be one in which the eye is penetrated from the most favorable quadrant. (*S... item as* 7.2–138, Feb. 1956 and 7I–174, Sept. 1956 *MAB.*) *Subject Headings:* **1. Hurricane rec... naissance 2. Steering currents 3. Hyperbolic point of hurricane.**—*Author's abstract.*

**7J–166** 551.51...

Simpson, Robert H. (*Dir., Project Wildwind, U. S. W. B.*), **The Weather Bureau sizes up ... hurricane problem.** *Bell Telephone Magazine,* N. Y., 34(3):144–152, Autumn, **1955.** ph... 5 figs. Also: Simpson, R. H.; Johnson, A. W. and Gentry, R. C., **Operation of the Natio... Research Project.** *Weatherwise,* Boston, 9(4):111–120, Aug. **1956.** 8 figs. **DWB**—Two popu... articles on hurricanes and their study, with particular reference to the National Hurricane Resea... Project (Project Wildwind). The first article discusses hurricane forecasting, recent shifts in ... distribution of hurricane paths in the North Atlantic area and its possible causes, and the possibi... of a control of hurricane movement. In the second article the objectives, aircraft reconnaissa... program, data analysis program and other tasks connected with the Project are described in s... detail. *Subject Headings:* **1. Hurricane research 2. National Hurricane Research Project** ... *G.T., M.R.*

**7J–167** 551.515.2(...

Stapleton, Bill, **Hurricanes coming? Are there any more at home like Carol, Edna and Haz...** *Colliers,* N. Y., 135(8):23–27, April 15, **1955.** photos. **DWB**—Full page chart in color shows pa... of four hurricanes ("Carol," "Dolly," "Edna," and "Hazel") which affected east coast of Uni... States in Sept. and Oct. 1954. Interviews with RIEHL, NAMIAS, SIMPSON, TANNEHILL, REICH... DERFER, DUNN and others interested in hurricane forecasting or research are reported. None ag... that 1955 will repeat 1954's record, but possibility that warming in high latitudes may incre... incidence of hurricanes in North Atlantic States is recognized. "Climatron" computers at Suitla... Md., reconnaissance activities of Air Force and Navy, and incidence connected with four hurrica... of 1954 are reported. *Subject Headings:* **1. Hurricanes, 1954 2. Hurricane research 3. N... England.**—*M.R.*

**7J–168** 551.515.2:551.57...

Sumner, H. C. and O'Connell, Thomas J. (*U. S. W. B., Wash., D. C.*), **Hurricane rains cau... devastating floods.** *Weatherwise,* Boston, 8(5):124–126, Oct. **1955.** 2 figs. **DWB**—A br... account is given of the rainfall and flood conditions accompanying the hurricanes "Connie" a... "Diane" during 1955. Maps with isohyets of the rainfall caused by these hurricanes are presente... *Subject Heading:* **1. Hurricane floods.**—*I.L.D.*

**7J–169** 551.51...

Takahashi, K., **On the relationship between typhoon energy and damage amount.** (... UNESCO Symposium on Typhoons, Tokyo, Nov. 9–12, 1954, **Proceedings,** pub. **1955.** p. 23–... 3 figs., 2 tables, 4 refs., 10 eqs.) **DWB**—Theoretical and empirical equations are developed ... calculating the kinetic energy and power of a typhoon from the radius and central pressure of t... phoons. Tables giving the kinetic energy and power for typhoons which struck Japan and t... amount of damage associated with each typhoon are presented. It was found that the energ... is almost proportional to the power of the typhoon and the amount of damage is roughly proportion... to energy and power of the typhoon. "Extent of damage (loss of life) is nearly proportional to t... cube of the maximum wind speeds." Also a "direct relationship exists between amount of dama... and cube of the total precipitation" for a single day. *Subject Headings:* **1. Typhoon energy-dama... relationships 2. Energy of typhoons 3. Japan.**—*I.L.D.*

**7J–170** 551.515.2:656...

Taylor, William H., **In case another hurricane comes, Pt. 1–2.** Unpaged. Reprint fro... *Yachting,* April and June, **1955.** photos. **DWB**—In view of the possibility that hurricanes may ... more frequent in the New England area than in the past 10–15 yrs, **Yachting** conducted a survey ... find out what yacht owners thought to be the most significant factors in hurricane damage, or ... avoiding hurricane damage to small craft. Some thought timely warnings to be the importa... factor but most admitted it to be mooring practices. These are discussed and the best syste... recommended for periods of hurricane danger. *Subject Headings:* **1. Hurricane damage to sma... craft 2. Hurricane warnings 3. New England.**—*M.R.*

**7J–171** 551.509.5:551.515...

U. S. Weather Bureau, **Bulletins and advisories issued by Weather Bureau Office, Miam... Florida and Weather Bureau Airport Station, Wash., D. C. on Hurricane "Connie" 0100 EST Au... 4, 1955 through 1400 EST Aug. 13, 1955.** 32 p. Also its: **Bulletins . . . issued by Weather Burea... Airport Station, San Juan, Puerto Rico, Weather Bureau Office, Miami, Florida and Weath...**

ureau Airport Station, Wash., D. C. on Hurricane "Ione" 1000 EST Sept. 14, 1955 through 1100 ST Sept. 21, 1955. 24 p. Also its: Bulletins . . . issued by Weather Bureau Airport Station, n Juan, Puerto Rico, Weather Bureau Office, Miami, Florida and Weather Bureau Office, New leans, Louisiana on Hurricane "Janet" 0300 EST Sept. 22, 1955 through 2300 EST Sept. 29, 1955. p. Also its: Bulletins . . . issued by Weather Bureau Office, Miami, Florida and Weather ureau Airport Station, Wash., D. C. on Hurricane "Diane" 0700 EST Aug. 11, 1955 through 2300 ST Aug. 17, 1955. 20 p. DWB—Verbatim reproductions of a total of well over a hundred adsories issued by Weather Bureau offices in connection with four hurricanes of the 1955 season. *bject Headings:* 1. Hurricane advisories 2. Hurricane "Connie" (1955) 3. Hurricane "Ione" 955) 4. Hurricane "Janet" (1955) 5. Hurricane "Diane" (1955) 6. Atlantic Coast of United ates.

7J–172 551.515.2:551.509.5

U. S. Weather Bureau. **Hurricane bulletins for the public.** Its *Multiple Address Letter*, No. 7–55, to all first order stations in Regions One and Two, July 8, 1955. 4 p. DWB—Advisory structions for forecast centers to guide them in making hurricane advisories more easily underood by the public and other information about distribution and release of hurricane warnings and vice, based on experiences of the 1954 hurricane season. Example of an alert, a local bulletin sed on such an "alert," an intermediate position report and a follow-up based on an intermediate sition report are given. *Subject Headings:* 1. Hurricane warnings 2. Hurricane alerts.—*M.R.*

7J–173 551.515.2(263.5)

U. S. Weather Bureau. **Notes on hurricane habits and habitats.** Its *L.S.* 5504, July 12, 1955. p. DWB—A condensed summary of knowledge about the origin, movement, frequency (per year d per month), wind speeds, forward movement, life span, destructive area, storm waves, lowest essure, greatest rainfall, and the "eye" of the hurricane. In 1933 there were 21 hurricanes and 1890 only one. The average is 8 per year and Sept. is the month with the highest frequency. ghest wind recorded was 186 mph at Blue Hill in 1938. Lowest pressure was 26.35" (892 mb) Long Key, Fla. The above does not apply to the similar typhoons of the Far East. *Subject adings:* 1. Hurricane statistics 2. Caribbean Sea.—*M.R.*

7J–174 551.515.2

U. S. Weather Bureau, **Notes on the naming of hurricanes.** March 15, 1955. 2 p. Mimeo. WB—Suggestions have been made to use letters, numbers, Greek letters, boys' names, the phonetic habet used in communications, names of animals, or adjectives, instead of girls' names for identing hurricanes. The earliest known system was the identification by Saint's Day on which the rricane occurred. The difficulty is that 2 or more storms may occur on the same day in different tors of the same region. The test of a name is given as: 1) short, 2) clearly pronounced, 3) quickly ognized and 4) easily remembered. Thousands of calls, telegrams, newspaper dispatches and dio or television reports concern one hurricane. Girls names first used by STEWART in **Storm** 041), fill the bill admirably. In the Atlantic one set of girls names for each year is sufficient as is the record number for one year. In Pacific 4 sets are used in rotation, regardless of year or son. *Subject Heading:* 1. Hurricane names.—*M.R.*

7J–175 551.509.5:551.515.2:06

U. S. Weather Bureau, **Notes on the Weather Bureau hurricane warning system.** Its *L.S.* 03, May 9, 1955. 2 p. DWB—The U. S. W. B. hurricane warning service is described briefly. re forecast centers (Boston, Washington, New Orleans, Miami and San Juan, Puerto Rico) cover an and land areas as specified. As a rule, 4 advisories are issued each day (5:00 and 11:00 a.m. 1 p.m. e.s.t.) but when a storm nears land, additional advisories may be issued. Alerts and rnings are distributed immediately on every available teletype, radio, television or other comnication channel, and other interested agencies kept in constant contact with the situation. *bject Heading:* 1. U. S. Weather Bureau Hurricane warning service.—*M.R.*

7J–176 551.515.2:551.579.4

U. S. Weather Bureau. **Preliminary report of hurricane Diane and floods, Aug. 1955.** Wash., C., U. S. Weather Bureau, Aug. 25, 1955. 3 p. fig. DWB—A concise report of hurricane iane" from Aug. 12 to 20, 1955, including discussion of rainfall in Northeastern States that proed devastating floods and damage in Pennsylvania and Connecticut. Flood stage data are sented in a table for 12 basins from Virginia to Massachusetts, and a large isohyetal chart of the ion shows areas of greatest precipitation (Aug. 17–20) with centers of >11" in Virginia and >16" Connecticut and Massachusetts. *Subject Headings:* 1. Hurricane floods, Northeastern United tes (Aug. 1955) 2. Hurricane "Diane" (1955) 3. Northeastern United States.—*M.R.*

**7J–177** 551.515.2:55

Unoki, S., **General aspect of wind waves and swell in the vicinity of Japan.** *Papers in Me ology and Geophysics*, Tokyo, 6(2):172–184, Sept. **1955.** 5 figs., 7 tables, 3 refs. **DWB—** statistical study is based on wind wave and swell observations made along all coasts of Japan f 1951 to 1954. Data on frequency distribution of waves and swell of specified magnitude, durat annual variation, wave length and period are presented in an arrangement classified accordin the synoptic situations involved. Eight different types of synoptic situations are describe being associated with waves over 2 m high in 1953 and 1954 (including both wind waves and sv and their frequency of occurrence is analyzed. Two of these eight types involve typhoons, nam the case when a typhoon approaches within 600 mi of a station and the case when its distance f the station remains over 600 mi. High swell (3∼4 m) is caused on the Pacific coast of soutl Japan by typhoons 2000∼3000 km distant. *Subject Headings:* **1. Hurricane swell 2. Wind wa 3. Japan.**—*G.T.*

**7J–178** 551.515.2:55

§Unoki, Sanae and Nakano, Masito, **Note on forecasting ocean waves caused by typho** *Records of Oceanographic Works in Japan*, Tokyo, n.s., 2(1):151–161, March **1955.** 9 figs., 2 tab 7 refs. **DWB—**Waves from typhoons cause great damage on coasts of Japanese islands. T types of typhoons are considered: a) those passing toward the west far to the south of Japan b) those recurving so as to pass to the northeast on the Pacific side of Japan. The latter give heaviest swells or waves, but the former also produce swells that cause damage. The Sverdr Munk method was used to analyze waves occurring in 9 typhoons of Type b from Oct. 1952 to A **1954.** The maximum wave heights occur in the heaviest storms and when nearest to the poin observation (as seen on chart), and on the same chart of tracks it can be seen that maximum pe occurs several hours later. Quantitative relationships are shown in tables and charts or gra Frequency distribution of wave periods shows maximum at about 15 sec. but some of several minu occur also. *Subject Headings:* **1. Typhoon waves 2. Typhoon swell 3. Japan.**—*M.R.*

**7J–179** 551.515.2(52):551.46

Wadati, K. and Hirono, R., **Storm tides caused by typhoons.** (In: UNESCO Symposium Typhoons, Tokyo, Nov. 9–12, 1954, **Proceedings,** pub. **1955.** p. 31–48. 13 figs., 13 tables, 19 re **DWB**—The major storm tides which have occurred along the coastal waters of Japan from 190 1953 are listed and their frequency of occurrence is shown on a map. The characteristics of storms in the area of their most frequent occurrence, namely: Tokyo Bay, Osaka Bay, the Inla Sea, the Ariake Sea, Toyama Bay and Suruga Bay are described with the aid of mareograms storm tides and maps. Storm tides are classified into two types, viz.: quasistatical rise of sea le (astronomical high tide; piling up of sea water along the coast by drift current, statical and namical; and suction of the water by low pressure, statical and dynamical) and huge swell. problem of disaster prevention is considered. (*Same item as* 7.4–162, April 1956, *MAB.*) *Sub Headings:* **1. Storm tides 2. Hurricane tides 3. Japan.**—*I.L.D.*

**7J–180** 551.509.52:551.51

**Worst weather ever?** *Newsweek*, N. Y., 46(9):49–51, Aug. 29, **1955.** fig., 2 photos. **DWB** A general discussion of problems faced by meteorologists in dealing with public reaction to erra behavior of hurricanes in past few years, and in answering the ever-present query as to whet or not the climate is changing. Abnormal weather is considered by meteorologists as norma the normal being merely the average of all the abnormal occurrences. A schematic model of hur cane structure is included (in color), and the role of the jet stream (Namias) is described. Append are a photograph, laudatory sketch of GORDON E. DUNN's career and role as the U. S. Weatl Bureau's chief hurricane forecaster (at Miami) since GRADY NORTON died at the untimely age 60 in 1954. *Subject Headings:* **1. Hurricane forecasting problems 2. Dunn, Gordon E.**—*M.R.*

## 1956

**7J–181** 551.515.2:551.509.3

Bellow, Francis, **Hurricanes.** *Fortune*, N. Y., 54(2):115–119; 124–136, Aug. **1956.** 8 illu **DLC**—A major "popular science" article attempting by means of colored illustrations (cross sectio hurricane track charts, etc.) to explain the cause, geographic distribution, structure, movement a history of some of the recent hurricanes affecting the Atlantic coast of the U. S. The forecasts ma by the U. S. Weather Bureau, the Navy and Joint Numerical Weather Prediction Unit for Hurrica "Ione" (Aug. 1955) are compared and the National Hurricane Research Project program of t U. S. Weather Bureau (including shore and airplane radar and reconnaissance observations duri the "season") is outlined. Use of rockets for photography and dry ice to try to modify hurrican

heir earlier stages is also in the program. *Subject Headings:* **1. Hurricane research 2. National rricane Research Project 3. Numerical forecasting of hurricanes 4. Hurricane "Ione" (1955).** *M.R.*

**7J–182** 551.515.2:912(74/75,263)

Caribbean and Coast Map Company, Miami, Florida. **1956 Hurricane map, compiled from hentic data furnished by the United States Weather Bureau, showing all tropical storms of ricane intensity for the past five years (1951–1955 inclusive).** printed **1956.** 38×54 cm. in or. **DWB**—An attractive wall map showing the names and year of each hurricane which affected Gulf of Mexico, Caribbean or Atlantic west of 60°W during 1951–55. Ten of the 30 storms ched the coastal areas of the U. S. between Florida and Cape Cod. None hit Texas or Louisiana, nough 6 struck Mexico south of Brownsville and some of them may have affected the southern of Texas. Facts and data on hurricanes are given in brief text which is inset in red and green e. *Subject Headings:* **1. Hurricane track chart (1951 55) 2. Atlantic Coast of United States Mexico 4. Caribbean Region 5. Western Atlantic.**—*M.R.*

**7J–183** 551.515.2:551.577(729.4)

**Le cyclone Hazel, 11–13 octobre 1954.** [Hurricane "Hazel," Oct. 11–13, 1954.] *Port-au- nce, Haiti. Petit-Seminaire Collège St. Martial, Observatoire Météorologique, Bulletin Annuel,* 4:59–70. pub. **1956.** diagrs., photos, table. **DWB**—Although Hurricane "Hazel" did a at deal of damage in the U. S., that damage was considered as an "echo" of the damage done in SW corner of Haiti where from Oct. 11–20, 500 to 1950 mm of rain (20 to 78 in.) fell in the untains. History of this and previous tropical storms and damage by areas are presented along h pictures of wind and flood damage. This was considered the most devastating on record (since 1). *Subject Headings:* **1. Hurricane "Hazel" (1954) 2. Hurricane damage 3. Hurricane nfall 4. Haiti.**—*M.R.*

**7J–184** 551.515.2(73,729.5,729.1)

Dunn, Gordon. **The three most severe hurricanes of record.** *Weatherwise*, Boston, 9(4):126–, Aug. **1956. DWB**—A tabular compilation of the 3 most severe hurricanes affecting each of 57 es in the U. S., Puerto Rico and Cuba (mostly) from 1871 to date. The maximum wind, lowest ometer and date of each storm are given. The highest speed was 149 mph at San Juan, Puerto o on 9/13/1928. The lowest barometer was 27.05″ at Havana on 10/10/1846. Greatest speed in S. was 134 mph on 9/14/44 at Cape Henry, Va. *Subject Headings:* **1. Hurricane statistics 2. Se- e hurricanes.**—*M.R.*

**7J–185** 551.515.2:551.461

Freeman, John C., Jr., and Baer, Ledolph, **Graphical computation of hurricane storm tides.** f Consultants, College Station, Texas, Contract Cwb-8687, Weather and Sea Studies, [1956?] p. +25 figs. refs., 24 eqs. **DWB**—From equations of motion of wind-driven currents applied to ricane tides, a graphical method of tide computation is derived. The use of this method is wn on the example of Hurricane "Baker" (1950). Disagreement between computed and ob- ved values of water level make a revision of the method necessary. *Subject Heading:* **1. Hurricane computation.**—*G.T.*

**7J–186** 551.515.2:551.501.8

Hennessy, J. and Brann, H., **Mass detection methods for tropical cyclone warning purposes.** : Tropical Cyclone Conference, Brisbane, Queensland, Sept. 1955, **Report.** Melbourne, Bureau Meteorology, [1956?] p. 139–171. 2 figs., 3 tables, 25 refs. Discussion p. 168–171.) **DWB**— s subject is dealt with under the headings of radar, sferics and microseisms. The uses and limita- ns of radar for the making of weather observations are outlined. It is stressed that the radar l gives information regarding the precipitation occurring within its effective range and that m warning advices will follow from the inferences drawn from radar and other observations. The e of atmospherics direction finding equipment it is proposed to employ in Queensland will sense occurrence of lightning flashes up to 2000 mi distant and by synchronization of observations n three stations will determine the location where the flashes originated. An outline of overseas erience is given. Observations of microseisms have been found by U. S. workers to give early ications of the development of tropical cyclones under certain conditions. Some limitations of method are discussed. *Subject Headings:* **1. Radar observation of tropical cyclones 2. Sferics n hurricanes 3. Microseismic storm-tracking.**—*Authors' abstract.*

**7J–187** 551.509.52:551.509.312:551.515.2

Hubert, Lester F. (*U. S. W. B., Wash., D. C.*), **Numerical weather prediction of hurricane ion.** *U. S. Weather Bureau, National Hurricane Research Project, Report,* No. 2, July **1956.**

28 p. 28 figs., 2 tables, [illegible] Pre-printed paper. DWB—Although the barotropic [illegible] used in preparing the Joint Numerical Weather Prediction Unit's 500 mb prognostic charts [illegible] specifically designed for predicting hurricane motion, such predictions will be made whenever a hurricane Low appears on the initial map. The purpose of this paper is to acquaint forecasters with the methods used in preparing 24, 48 and 72 hr forecasts of hurricane positions [illegible] them to make proper use of such forecasts in conjunction with [illegible] Results of [illegible] numerical forecasts [illegible] graphically compared with actual tracks and [illegible] *Subject Headings:* 1. Numerical forecasting of hurricanes 2. Hurricane movement forecasting.—[illegible]

7J-188 551.515.2 [illegible]

Iselin, Columbus O'D., **We hope to witness the start of a hurricane.** [illegible] Mass. [illegible] Spring 1956. 2 photos. DWB, DLC—[illegible] members are mentioned, as well as the proposed use of the newly acquired research vessel "Crawford," for the first five months in hurricane research. The theory of hurricane genesis [illegible] is to be tested is outlined. This will be the first [illegible] vessel ever assigned [illegible] origin of hurricanes. *Subject Headings:* 1. Hurricane genesis 2. Hurricane research ships.—[illegible]

7J-189 551.515.2 [illegible]

Laban, John, **Hurricane Janet at Swan Island, a personal encounter.** [illegible] 9(4):[illegible], Aug. 1956. 2 figs. DWB—[illegible] in the flimsy weather station on Swan Island in the [illegible] during the passage of "Janet" [illegible] 27, 1955. The wind increased during the 0900 Raob from 14 mps [illegible] time Raob reached 45,000 ft and was terminated. [illegible] sea 70 ft from ESE. Shortly after the wind reached [illegible] to pieces. The men huddled behind a concrete [illegible] Later they escaped to the "Seismo" building [illegible] spent the next few days. The island was stripped of about 10,000 coconut trees. [illegible] estimated [illegible] *Subject Headings:* 1. Hurricane "Janet" 1955 2. Swan Island [illegible] M.F.

7J-190 551.515.2 [illegible]

Mackey, G. W., **Waves, swell and surf generated** [illegible] In: Tropical Cyclone Conference, [illegible] Queensland, Sept. 1955. **Report.** Melbourne, Bureau of Meteorology [illegible] 7 refs., eqs. Discussion p. 63.) DWB—A qualitative [illegible] waves and resultant swell from the [illegible] of wind on the sea surface and [illegible] ment of surf on beaches. The foregoing, as applied to [illegible] made to correlate observations from a ship [illegible] 1. Hurricane swell.—*Author's abstract.*

7J-191 551.515.2 [illegible]

Munk, Walter [illegible] **Edge waves on the continental shelf.** *Science,* Wash., D. C., 123(3187):[illegible], June 1956. [illegible] Also summarized in their: **Resurgent high water associated with coastal hurricanes.** [illegible] U. S. Weather Bureau, Aug. [illegible] 1955. [illegible] DWB—[illegible] calculations of [illegible] of edge waves along the continental shelf [illegible] where [illegible] the [illegible] Sandy Hook show good agreement. [illegible] 1. Hurricane tide forecasting 2. Edge wave calculations 3. New Jersey [illegible]

7J-192 551.515.2 [illegible]

[illegible] **Windstorm damage prevention.** [illegible] 40 p. [illegible] *Subject Headings:* 1. Hurricane wind damage 2. Wind damage prevention.—[illegible]

7J-193 551.509.5 [illegible]

[illegible] **Cyclone warnings terminology.** In: Tropical Cyclone Conference, Brisbane, Queensland, Sept. 1955. Report. Melbourne, Bureau of Meteorology [illegible] 2 refs. Discussion p. [illegible]) Also [illegible] **Organisation for issue of cyclone warnings from Brisbane Weather Bureau during 1954-55 cyclone season.** [illegible] Warnings for the protection of the public. [illegible]

lone warnings for shipping. *Ibid.*, p. 216–221. **DWB**—These four articles give a detailed cription of the storm warning system of Queensland, Australia. The terminology used in various es of warnings, the organization and staffing of the warning services and the responsibilities of various agencies are discussed as well as technical details of operation. *Subject Headings:* Hurricane warning services 2. Queensland hurricane warning service 3. Terminology.—*G.T.*

**7J–194** 551.515.2

O'Mahony, G., **Case histories of tropical cyclones.** In: Tropical Cyclone Conference, Brisbane, eensland, Sept. 1955, Report. Melbourne, Bureau of Meteorology, [1956?] p. 107–117. n. Discussion p. 115–117.) **DWB**—The paper sets out the method which will be used for intaining the case histories of tropical cyclones in the Australian region. The histories will be l under one cover in the "control" office Brisbane, Perth or Darwin) and will consist of surface l upper air charts together with any additional information, such as aircraft and ship reports, wspaper accounts, etc., which may be helpful in presenting a better picture of the formation l life of the cyclones. Included in the histories will be an individual cyclone report and also a sonal report. The reports will be made out in the "control" office and will review each cyclone l each cyclone season and will examine critically the forecast techniques used and the degree uccess obtained. In addition a scheme is set out for inclusion of relevant data on punch cards. *ject Heading:* 1. Tropical cyclone records.—*Author's abstract.*

**7J–195** 551.515.2:551.507.321

Ross, Malcolm D. (*Air Branch, Naval Sciences Div., Off. of Naval Res.*), **Hurricoon—a new oon system for hurricane research.** *U. S. Office of Naval Research, Research Reviews,* June 1956. –3. fig. Also: Masterson, John E. (*Geophysics Branch, ONR*), **Rocket photography of hurri-es.** *Ibid.*, p. 4–7. 2 figs. **DWB**—Two new methods of hurricane observation used by the S. Navy are described. The Hurricoon is a Skyhook plastic balloon carrying photographic ipment. It will be launched from the coast and carried out over the sea at an altitude between )00 and 70,000 ft by a westerly current. At a suitable point (on radio command) it will then above 80,000 ft into the easterly current and float back to the mainland, taking pictures of the ricane over which it is calculated to pass for about 12 hrs.—Other photographs of hurricanes be taken under the Rocket Photography of Hurricanes Project whose planned operations are ribed in the second note. *Subject Headings:* 1. Rocket photography 2. Hurricane photography kyhook balloons.—*G.T.*

**7J–196** 551.515.2:551.577(74/76)

*Schoner, R. W. and Molansky, S. (*U. S. W. B., Wash., D. C.*), **Rainfall associated with hurri-es and other tropical disturbances.** *U. S. Weather Bureau, National Hurricane Research Project, ort,* No. 3, July 1956. 305 p. numerous figs. and tables. Pre-printed report. **DWB**—Data on fall associated with hurricanes which occurred since 1900, namely: 78 storms in the Gulf of ico coastal region, 111 in the South Atlantic coastal region and 25 in the North Atlantic coastal on. The data given for each hurricane include: 1) a meteorological summary, 2) tabulated unts of rainfall for specified areas (in sq mi) and specified periods of duration (in a few cases e tabulated data are omitted) and 3) isohyetal maps for the total storm and parts of it. *Subject dings:* 1. Hurricane rainfall data 2. Gulf Coast 3. Atlantic Coast of United States.—*G.T.*

**7J–197** 551.515.2(764)

U. S. Beach Erosion Board, **Hurricanes affecting the coast of Texas from Galveston to Rio nde.** Its *Technical Memorandum,* No. 78, March 1956. 17+33 p. figs. (incl. maps), 3 tables, efs. **DWB**—Hurricanes and tropical cyclones entering the State of Texas from the Gulf, between 3 and 1955 are listed, described, charted and the damage caused by each mentioned. In all, torms were found in the records during 138 years, or about 1 every 2.5 years. A rough cyclic ibution of hurricane-rich and hurricane-poor years was found, averaging 15.6 years (8–26 years), a rough correspondence to sunspot cycles (peaks on increasing or sunspot maximum, troughs inimum or diminishing activity) so that a forecast for 1956–9 to be hurricane-rich, is ventured greement with Willett). All storms occurred in June–Nov. with a peak of 31% in Sept. *Subject dings:* 1. Hurricane cronologies 2. Hurricane forecasting 3. Texas.—*M.R.*

**7J–198** 551.509.52:551.515.2:654.16

U. S. Weather Bureau, **Emergency radio in hurricanes: the cooperation of radio amateurs in ther emergencies.** On reverse of Its *Daily Weather Map,* Sept. 25, 1956. **DWB**—The Weather teur Reporting Network was established in June 1951. At the close of the 1955 hurricane on it comprised 48 stations (including those provided by the Florida Highway Patrol, the Florida er and Light Company and the Florida Power Corporation) whose purpose it is to transmit l information during the passage of a hurricane over Florida to the Hurricane Warning Center

at the Miami Weather Bureau. Details of operation are discussed and illustrated. *Subject ings:* **1. Weather Amateur Reporting Network 2. Cooperative hurricane warning service.**—*G*

**7J–199** 551.509.52:551.51

U. S. Weather Bureau, **Hurricane circuit, WB PL 7021, Manual of operations. 1956.** Mimeo. **DWB**—Instructions for observers and operators on the Gulf of Mexico Hurricane Ci The Circuit consists of 43 Weather Bureau stations, one Civil Aeronautics Administration, 7 Navy and 2 U. S. Air Force stations in Texas, Louisiana, Alabama, Georgia, Florida and Mi. *Subject Headings:* **1. Hurricane warning services 2. Gulf of Mexico Hurricane Circuit.**—*M.R.*

**7J–200** 551.515.2:551.579.4(7

*U. S. Weather Bureau, **Hurricane rains and floods of August 1955, Carolinas to New Eng** Its *Technical Paper*, No. 26, April **1956.** 148 p. numerous figs. and tables. 36 refs. **$1.00. DWB**—On Aug. 18–20, 1955, devastating floods produced by rainfall associated Hurricane "Diane" occurred along the Atlantic coast of the U. S. The case history of rainfall floods is treated in three sections. Pt. 1 (p. 3–21) is a detailed meteorological analysis of the c and development of the heavy rainfall, its distribution, etc. Pt. 2 (p. 23–52) includes flood (stage hydrographs, etc.), their discussion and comparison with earlier floods, and illustratio flood damage. In Pt. 3 (p. 53–148) a complete tabulation of hourly and daily precipitation in 1955 is given for stations in the Atlantic coastal states from South Carolina to New England. *Su Headings:* **1 Hurricane floods 2. Hurricane "Diane" (1955) 3. Atlantic Coast of United St I. Mook, Conrad P.**—*G.T.*

**7J–201** 551.509.6

Yaeger, Philip B., **We're spending $50,000,000 to change the weather.** *Nation's Busi* 44(7):66–71, July **1956.** 2 photos. **DLC**—Legal aspects of weather control (problem of liab existing state laws, need for federal legislation) are discussed. The article includes an account o hurricane which changed its course and hit the U. S. coast after being seeded from a Hurri Hunter airplane (Oct. 13, 1947), and brief description of the National Hurricane Research Pr scheduled to start operations at West Palm Beach, Fla., in summer 1956. *Subject Headings:* **1. L aspects of weather control 2. National Hurricane Research Project 3. Hurricane control.**—*G*

## SUPPLEMENTARY MATERIAL

**7J–202** 551:577.37:551.577.61:551.579.4(

**Billion-dollar flash flood.** *Life*, Chicago, 39(9):16–23, Aug. 29, **1955.** photos. **DWB**—V pictures with brief text showing or telling of disaster that hit various towns in Connecticut du and after hurricane "Diane" of Aug. 17–19, 1955. *Subject Headings:* **1. Flood photographs Hurricane "Diane" (1955) 3. Hurricane flood damage 4. Connecticut.**—*M.R.*

**7J–203** 551.515.2:551.461.2

Miyazaki, M. (*Kobe Marine Obs.*), **A theory of the storm surge.** *Geophysical Magazine*, To 27(3):401–449, Sept. **1956.** 19 figs., 15 refs., 130 eqs. **DWB, DLC**—An elaborate mathemat analysis is given of waves and coastal sea-level variations associated with travelling disturba (including specific cases of typhoons), accounting for the Coriolis parameter and bottom frict From basic equations concerning the cases of deep or shallow, bounded or semi-infinite oce numerical patterns of sea-level variations during typhoons and other disturbances are graphic presented, including a comparative graph representing the theoretical pattern of surge caused the Muroto typhoon (1934) and thd sea-level variations observed at Osaka during that typh *Subject Headings:* **1. Storm surge theory 2. Muroto Typhoon (1934) 3. Osaka Bay, Japan.**—*G*

**7J–204** 551.553.8:551.515.2 551.515.2:55

Myers, Vance A. and Jordan, Elizabeth S. (*U. S. W. B., Wash., D. C.*), **Winds and pressu over the sea in the hurricane of September 1138.** *Monthly Weather Review*, 84(7):261–270, J **1956.** 12 figs., table, 18 refs. **DWB, DLC**—The winds and pressures over the sea in the N England hurricane of Sept. 1938 are reconstructed, making the meteorological ingredients availa for a meteorological-oceanographic investigation of the record tide produced by this storm on southern New England coast. The methods of analysis of the meteorological data are applica to other hurricanes. *Subject Headings:* **1. Hurricane pressure data 2. Hurricane wind data Hurricane, New England (1938).**—*G.T.*

**7J–205** 551.5:368(73)

U. S. Congress. Senate. Committee on Banking and Currency. **Federal disaster insurance: aff study for the Committee.** 84th Congrdss, 1st session. Nov. 30, 1955. Wash., D. C. U. S. ovt. Print. Off., **1955.** 419 p. 26 figs., photos, forms, charts, 51 tables, glossary, p. 415–417. **WB**—A voluminous report giving the basic facts on various types of natural disasters in the U. S., aska, Hawaii, etc. The data on floods and flood damage, hurricanes and hurricane damage, rnadoes and tornado damage, tidal waves, earthquakes, volcanic eruptions, smog, radioactive plosions, winter storms, thunderstorms and hailstorms are presented in numerous tables and on aps and graphs showing damage by years, states or regions, seasons, etc. Excellent photographs owing damage in recent hurricanes, floods, tornadoes and other disasters are included. The rpose of the data is to provide a sound basis for legislation regarding relief and insurance by the leral government to alleviate the effects of such disasters which run into hundreds of millions ch year. *Subject Headings:* **1. Weather disasters 2. Hurricane damage 3. Flood damage 4. rnado damage 5. United States.**—*M.R.*

# PART III. REVIEWS OF RECENT IMPORTANT METEOROLOGICAL MATERIAL, AND METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

**Note:** The references of reviews of new books or monographs in the contents of periodicals included in this section are for information only and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of publication, the pagination may be omitted.

## A. REVIEWS OF IMPORTANT METEOROLOGICAL MATERI

Aubert de la Rue, E.: **Man and the winds, trans. from the French by M. E. Thompson.** Lond Hutchinson, 1955. 206 p. Review by Józsefné Békeffy in *Időjárás*, Budapest, 50(2). March/April 1956. (*See* 7.1–6, Jan. 1956, *MAB.*)

Brooks, Charles E. P.: **The English climate.** London, English Univ. Press, 1954. 213 p. 27 Price 12 sh. 6 d. Review by Catherine P. Snodgrass in *Scottish Geographical Magazine*, E burgh, 71(2):122–123, Sept. 1955. (*See* 5.11–1, Nov. 1954, *MAB.*)

Burgess, Eric: **Frontier to space.** London, Chapman & Hall, 1955. 174 p. Price 21 sh. Rev by K. R. Ramanathan in *Journal of Scientific and Industrial Research, Sec. A*, 15(6):284–2 June 1956. Review by R. J. Murgatroyd in *Meteorological Magazine*, London, 85(1009):2 221, July 1956. (*See* 6.10–5, Oct. 1955, *MAB.*)

Clarke, George L.: **Elements of ecology.** N. Y., Wiley, 1954. 534 p. 201 figs., 22 tables. Pr 60 sh. Review by H. L. Penman in *Royal Meteorological Society, Quarterly Journal*, 82(353):3 July 1956.

Cook, J. Gordon: **Our astonishing atmosphere.** London, Harrap, 1955. 200 p. illus. Pri 10 sh. 6 d. Review by L. C. W. Bonacina in *Geographical Journal*, London, 122(2):269–2 June 1956. (*See* 7.10–3, Oct. 1956, *MAB.*)

Den Tonkelaar, J. F.: **Middelen en Mogelihkjenen der Meteorologie** [Methods and possibilit in meteorology]. Amsterdam, Wereldboog, 1955. Review by A. Maenhout in *Ciel et Ter* Brussels, 71(11/12):432, Nov./Dec. 1955.

Doyle, Henry N.: **Polluted air: a growing community problem.** [In] *U. S. Public Health Servi Public Health Reports*, 68(9):858–867, Sept. 1953. 2 figs., 4 tables, 12 refs. Review by Z. Du hanina in *Gigiena i Sanitariia*, Moscow, No. 3:60, March 1955.

Flint, Richard Foster: **Glacial geology and the Pleistocene epoch.** N. Y., J. Wiley, 1947. 589 bibliog., plates. Review by J. Sölch in *Geographische Gesellschaft, Vienna, Mitteilunge* 92(4/6):97–101, 1950. (*See* G–114, July 1950, *MAB.*)

Jagsich, Juan: **Régimen hígrico de nuestra atmósfera** [Moisture regime of our atmosphere]. C doba, Universidad Nacional, Facultad de Ciencias Exactas, Fisicas y Naturales, 1953. 42 12 figs., 15 plates. Review by G. Fochler-Hauke in *Petermanns Geographische Mitteilunge* Gotha, 100(2):147, 1956.

Krick, Irving P. and Fleming, Roscoe: **Sun, sea and sky.** London, Victor Gollancz, 1955. 248 11 illus., 9 maps. Price 16 sh. Review by G. D. Robinson in *Weather*, London, 11(8):264–26 Aug. 1956. (*See* 6.7–6, July 1955, *MAB.*)

Kuenen, P. H.: **Realms of water; trans. by May Hollander.** London, Cleaver, Hume Press; N. Y John Wiley, 1955. 327 p. 16 plates, 190 figs. Price 35 sh. Review by W. B. R. King *Science Progress*, London, 44(175):564, July 1956. Review by G. H. D. in *Geographical Journa* London, 122(2):266–267, June 1956. (*See* 7.10–4, Oct. 1956, *MAB.*)

Netherlands. (K.) Meteorologisch Instituut: **1854-Koninklijk Nederlands Meteorologisch I stituut-1954** [Netherlands Meteorological Institute, 1854–1954]. 's-Gravenhage, Staat drukkerij- en Uitgeverijbedrijf, 1954. 469 p. numerous figs. Review by A. Schumache in *Deutsche Hydrographische Zeitschrift*, Hamburg, 8(4):167, 1955. (*See* 5.10–7, Oct. 195 *MAB.*)

**Papers in marine biology and oceanography, dedicated to Henry Bryant Bigelow.** Supplement Vol. 3 of Deep Sea Research, London. London, Pergamon Press, 1955. 498 p. figs., table

plates. Price $10.50. Review by R. S. Read in *Royal Meteorological Society, Quarterly Journal*, 82(353):380, July 1956.

anofsky, H. A.: **Introduction to dynamic meteorology.** Univ. Park, Pa., Pennsylvania State Univ., 1956. Review by J. S. Sawyer in *Royal Meteorological Society, Quarterly Journal*, 82(353):377–378, July 1956.

awsey, J. L. and Bracewell, R. N.: **Radio astronomy.** Oxford, Clarendon Press, 1955. 361 p. 150 figs., 23 plates. Price, 55 sh. Review by D. W. Dewhirst in *Science Progress*, London, 44(175):548, July 1956.

orteous, Crighton: **Broken river.** London, Robert Hale Ltd., 1955? 192 p. Price 10 sh. 9 d. Review by C. H. Archer in *Weather*, London, 11(8):264, Aug. 1956.

aethjen, P.: **Dynamik der Zyklonen** [Cyclone dynamics]. *Probleme der Kosmischen Physik*, Leipzig, Vol. 27, 1953. 384 p. 92 figs. Price, DM 35. Review by G. Schmidt in *Petermanns Geographische Mitteilungen*, Gotha, 100(2):142, 1956. (*See* 5.3–10, March 1954, *MAB.*)

odewald, Martin: **Der merkwürdige Winter 1956** [Remarkable winter of 1956]. [In] *Der Wetterlotse*, Hamburg, No. 98:37–50, March 1956. Review by Raoul Bilancini in *Rivista di Meteorologia Aeronautica*, 16(2):62, April/June 1956. (*See* 7.10–185, Oct. 1956, *MAB.*)

chneider-Carius, Karl: **Wetterkunde-Wetterforschung** [Meteorology and weather research]. Freiburg-Munich, Verlag K. Alber, 1955. 324 p. Review by Józsefné Békeffy in *Időjárás*, Budapest, 50(2):125, March/April 1956.

ears, Mary: **Notes on the Peruvian Coastal Current, Pt. 1, An introduction to the ecology of Pisco Bay.** [In] *Deep-Sea Research*, London, 1(3):141–169, April 1954. figs., tables, bibliog. Review in the *U. S. Coast and Geodetic Survey, Journal*, No. 6:175, Aug. 1955. (*See* 6.9–55, Sept. 1954, *MAB.*)

kliarov, V. M.: **Meteorologiia dlia gidrometnabliudateleĭ** [Meteorology for hydrometeorological observers]. Leningrad, Gidromet. Izdat, 1955. 295 p. Review by László Aujeszky in *Időjárás*, Budapest, 60(2):122–123, March/April 1956.

annehill, Ivan Ray: **The hurricane hunters.** New York, Dodd, Mead and Co., 1955. 271 p. illus. Price $3.00. Review by James M. Havens in *Weatherwise*, Boston, 9(4):142, Aug. 1956.

nsőld, A.: **Physik der Sternatmosphären** [Physics of stellar atmospheres]. 2d ed. Berlin, Springer Verlag, 1955. 866 p. 287 figs., 106 tables. Price 168 DM. Review by T. G. C. in *Royal Meteorological Society, Quarterly Journal*, 82(353):376–377, July 1956.

itkevich, V. I.: **Sel'skokhoziaistvennaia meteorologiia** [Agricultural meteorology]. Sel'khozgiz, M., 1955. 279 p. 82 figs., 48 tables, refs. Review by M. S. Kulik in *Meteorologiia i Gidrologiia*, Leningrad, No. 2:49–52, Feb. 1956.

Watts, I. E. M.: **Equatorial weather.** London, Univ. of London Press, 1955. 223 p. 164 figs. Price, 25 sh. Review by C. R. Burgess in *Institute of Navigation, London, Journal*, 9(3):363, July 1956. (*See* 7.4–10, April 1956, *MAB.*)

## 5. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

merican Meteorological Society, Bulletin, Vol. 37, No. 7, Sept. 1956

Lee Jean T. and Galway, Joseph G.: **Preliminary report on the relationship between the jet at the 200-mb level and tornado occurrence**, p. 327–332

Baynton, H. W.: **Multiple correlations of particulate air pollution with weather factors at Detroit and Windsor**, p. 333–337

Clodman, J.: **Visibility deterioration associated with operations of jet aircraft**, p. 338–341

Anderson, Albert D. and Mastenbrook, Henry J.: **A new upper air data system—the transosonde**, p. 342–350

Jehn, K. H.: **The challenge of television weather programs**, p. 351–353

**Mocambique Meteorological Service**, p. 354

**Cook Research Laboratories**, p. 354–357

American Meteorological Society: **Minutes of the council, New York meeting, January 24–25, 1956**, p. 358–361

**Meteorological activity in the Keystone State**, p. 362–363

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Showalter, A. K.: **A simple technique for measuring radius of curvature of streamlines**, p. 368–369

Schwerdtfeger, Werner: **A rapid method to determine light surface wind during reconnaissance flights**, p. 369

International Scientific Gliding Organization, 7th Congress, St. Yan, France, July 1956: **Abstracts of papers of the Meteorological Section**, p. 374–376

American Meteorological Society: **Conference on climatology: program [and abstracts of pap of the 148th National Meeting . . . Oct. 29–Nov. 1, 1956, at Asheville, North Carol** p. 378–386

**Archiv für Meteorologie, Geophysik und Bioklimatologie, Serie B,** Vienna, Vol. 7, No. 3/4, 1

Putnins, P.: **The paradox of the "inhomogeneity" of annual temperatures at Blue Hill,** p. 305–
Vowinckel, E.: **Das Klima des antarktischen Ozeans, I. Nord-Süd-Schnitt zwischen 20 u 40°E,** [The climate of the Antarctic Ocean, Pt. 1, North-South section between 20° a 40°E], p. 317–341; **II. West-Ost-Schnitt zwischen 50°W u. 150°E,** [Pt. 1, West-East s tion between 50°W and 150°E], p. 342–369
Trischler, F.: **Untersuchung über räumlich kohärente und singuläre Tagesniederschlä** [Research on spatially coherent and singular daily precipitation], p. 370–405
Arakawa, H.: **Two minima of the average rainfall at about the turn of the century and at ab 1940 in the Far East,** p. 406–412
Drummond, A. J.: **On the measurement of sky radiation,** p. 413–436
Drummond, A. J.: **Notes on the measurement of natural illumination, Pt. 1, Some charact istics of illumination recorders,** p. 437–465
Steinhauser, F.: **Über die Struktur der Niederschlagstage, in Österreich: Zahl und Folg von Niederschlagsstunden,** [The structure of precipitation days in Austria: number a succession of precipitation hours], p. 466–476
van der Bijl, W.: **Eine statistische Bemerkung zu Carmen Boute "Wirkungen elektrisch Felder und Strahlungen atmosphärischen u. kosmischen Ursprungs auf das Wasser** [Some statistical notes on Carmen Boute's "Action of electrical fields and radiation atmospheric and cosmic origin on water], p. 477–479

**Building Research Congress, Garston, 1951, Papers presented in Division 3,** pub. 1951

Mackey, G. O.: **The steady periodic state—a review of some computational methods,** p. 60–
Bruckmayer, F.: **Cooling and warming of buildings,** p. 66–74
Roux, A.J. A.: **The effect of weather conditions on heat transfer through building element** p. 82–87
Pratt, A. W. and Weston, J. C.: **The thermal capacity of buildings,** p. 88–93
van Gunst, E. and van Zuilen, D.: **The influence of moisture content on thermal conductivi of building materials,** p. 94–98
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Petherbridge, P.: **The computation and measurement of sky and daylight factors,** p. 162–166

**Erdkunde,** Bonn, Vol. 10, No. 1, Jan. 1956

Paffen, Kh.; Pillewizer, W. and Schneider, H.-J.: **Forschungen im Hunza-Karakorum. Vor läufiger Bericht über die wissenschaftlichen Arbeiten der Deutsch-Österreichische Himalaya-Karakorum-Expedition 1954,** [Investigations in Hunza-Karakorum: preliminar report on the scientific work of the German-Austrian expedition 1954], p. 1–33
Borchert, Günter: **Eine Untersuchung über die Wasserführung des Bodens in Abhängigkei vom Witterungsablauf und von der Vegetationsbedeckung,** [Investigation of wate conduction of the soil as a function of weather and vegetation cover], p. 76–81

Vol. 10, No. 2, April 1956

Sioli, Harald: **Über Natur und Mensch im brasilianischen Amazonasgebiet,** [Nature and man in the Brazilian Amazon region], p. 89–109
Weischet, Wolfgang: **Die räumliche Differenzierung klimatologischer Betrachtungsweisen Ein Vorschlag zur Gliederung der Klimatologie und zu ihrer Nomenklatur,** [Spatial differentiation of climatological viewpoints: a proposal for the organization of climatology and its nomenclature], p. 109–122
Beuermann, Arnold: **Die Waldverhältnisse im Peloponnes unter besonderer Berücksichtigung der Entwaldung und Aufforstung,** [Forest conditions in the Peloponnesus with special regard to deforestation and afforestation], p. 122–136

Vol. 10, No. 3, Aug. 1956

Straka, Herbert: **Die pollenanalytische Datierung von jüngeren Vulkanausbrüchen,** [Pollen analysis dating of recent volcanic eruptions], p. 204–216

**Journal of Atmospheric and Terrestrial Physics,** London, Vol. 9, No. 2/3, Aug./Sept. 1956

Chamberlain, Joseph W.: **Theory of the intensity plateau in the twilight airglow, (Resonance scattering by atmospheric sodium, Pt. 1),** p. 73–89
Dungey, J. W.: **The effect of ambipolar diffusion in the night-time *F* layer,** p. 90–102
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Szendrei, M. E. and McElhinny, M. W.: **Recombination and attachment in the *F*1 and *F*2 layers during the solar eclipse of 25 December 1954,** p. 118–130
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Pütter, P. St. and Court, G. W. G.: **Remarks on a paper by G. W. G. Court: "Ionospheric wind determination from spaced radio-receiver fading records,"** p. 163–164

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Chamberlain, Joseph W. and Negaard, Beverly J.: **Resonance scattering by atmospheric sodium, pt. 2 Nightglow theory,** p. 169–178
Beynon, W. J. G. and Thomas, J. O.: **The calculation of the true heights of reflection of radio waves in the ionosphere,** p. 184–200
Minnis, C. M.: **The response of the ionosphere to the solar eclipse of June 30, 1954 in Great Britain,** p. 201–209
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